Pests

AND THEIR CONTROL

1948

MARCH

VOL. 16, NO. 3

ORGAN OF THE PEST CONTROL INDUSTRY

Exterminators
Fumigators
Termite Control Operators
Entomologists
Insecticide and Supply Mfgrs.

RETURN POSTAGE GUARANTEED

COOK'S

Chlordane Formulations

Now you can get tailor-made chlordane formulations designed to fit any PCO's needs.

COOK'S All-Purpose PCO Concentrate

Fly-proof and roach-proof in one application, using Cook's All-Purpose PCO Concentrate containing "refined" Chlordane plus "activating" Extane. Mix 1 part Concentrate with 7 parts WATER or SOLVENT.

4/1 gals. to cs...$6.50 per gal.
5-gal. cans..... 6.25 per gal.
50-gal. drums.... 5.95 per gal.

20% Refined Chlordane Concentrate

This is 20% by weight. To be diluted 9:1 with deodorized petroleum solvent.

4/1 gals. to cs...$4.50 per gal.
5-gal. cans..... 4.25 per gal.
50-gal. drums.... 3.95 per gal.

50-E Chlordane Emulsion Concentrate

To mix with water. For industrial and vegetation use. Kills roaches, waterbugs, grasshoppers, mites, chiggers, red bugs, and certain other insects. CONTAINS 4 LBS. CHLORDANE PER GALLON.

12/1 qts. to cs. $32.00 per cs.
4/1 gals. to cs. 10.00 per gal.
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50-gal. drums .... 9.50 per gal.

2% Refined Chlordane Spray

Ready to use in stainless, deodorized petroleum solvent.

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50-gal. drum.... .95 per gal.

Technical Chlordane Agricultural Grade

700-lb. drum.....$1.70 per lb.
5-gal. (65 lbs. net wt.)..... 2.00 per lb.

Technical Chlordane Refined Grade

Drum (700 lb. net) ....$1.85 lb.
5-gal. (65 lb. net) ..... 2.25 lb.
1½-gal. (20 lb. net) .. 2.50 lb.

5% Chlordane Dust

25-lb. bag.....$0.19 per lb.
100-lb. drum..... 0.16 per lb.

50% Chlordane Wettable Powder

6/4 lb. bags to case.....$1.19 per lb.
100-lb. drum..... 1.17 per lb.

OUR GUARANTEE: All Cook formulations are guaranteed to be chemically and biologically standardized.

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COOK CHEMICAL COMPANY
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KANSAS CITY 8, MISSOURI

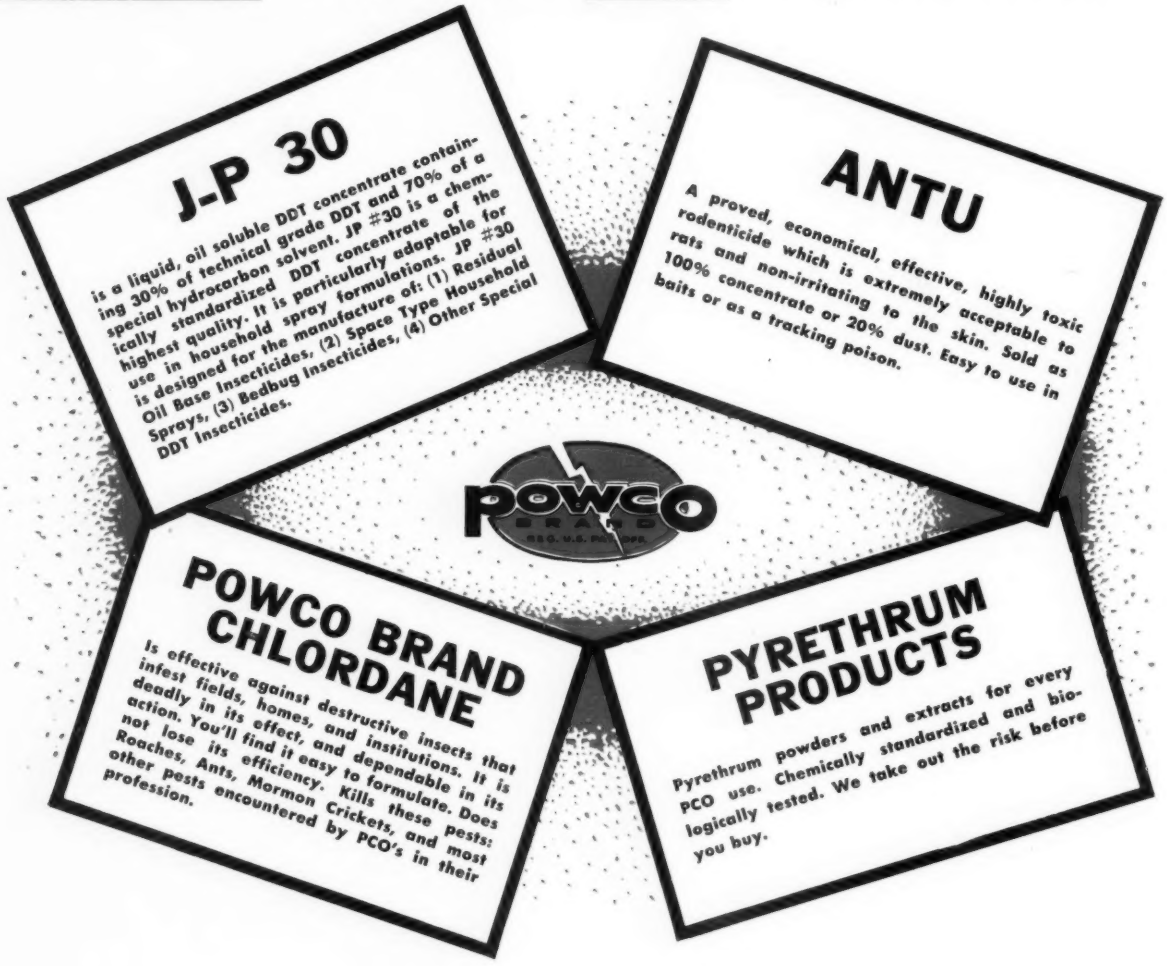
FREIGHT PAID ON QUANTITIES OF 100 LBS. OR MORE

Profits for PCO'S

GROW GROW GROW

with these

POWCO BRAND PCO MATERIALS


J-P 30
is a liquid, oil soluble DDT concentrate containing 30% of technical grade DDT and 70% of a special hydrocarbon solvent. JP #30 is a chemically standardized DDT concentrate of the highest quality. It is particularly adaptable for use in household spray formulations. JP #30 is designed for the manufacture of: (1) Residual Oil Base Insecticides, (2) Space Type Household Sprays, (3) Bedbug Insecticides, (4) Other Special DDT Insecticides.
ANTU
A proved, economical, effective, highly toxic rodenticide which is extremely acceptable to rats and non-irritating to the skin. Sold as 100% concentrate or 20% dust. Easy to use in baits or as a tracking poison.
POWCO
BRAND
POWCO BRAND CHLORDANE
Is effective against destructive insects that infest fields, homes, and institutions. It is deadly in its effect, and dependable in its action. You'll find it easy to formulate. Does not lose its efficiency. Kills these pests: Roaches, Ants, Mormon Crickets, and most other pests encountered by PCO's in their profession.
PYRETHRUM PRODUCTS
Pyrethrum powders and extracts for every PCO use. Chemically standardized and biologically tested. We take out the risk before you buy.

John Powell & Co., Inc.

ONE PARK AVENUE, NEW YORK 16, N. Y.

SALES OFFICES: CHICAGO • SAN FRANCISCO • PITTSBURGH • PHILADELPHIA • ST. LOUIS

Canada: Charles Albert Smith, Ltd., TORONTO • MONTREAL

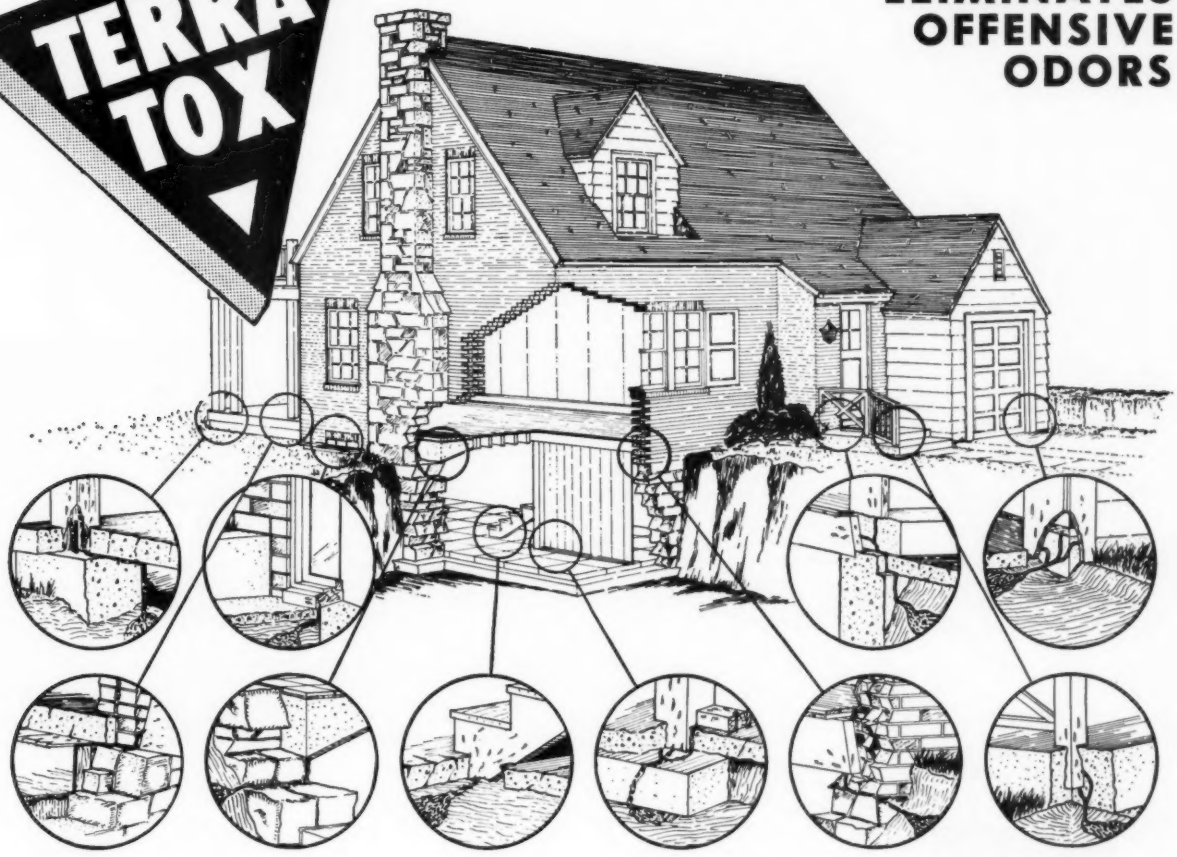
In Argentina—John Powell y Cia., Condarco 1535, Buenos Aires, Argentina, Telephone 59 Paternal 0021

POWCO BRAND PRODUCTS: *Antu • Pyrin R • Pyrin D-20 • JP #10 • JP #25 • JP #30 • JP #50 • JP 50W • Pyrethrum Powders and Extracts Stimtox "A" • Rotenone Powders • Sabadilla • Aerosol Formulas • 2, 4-D • BHC (Benzene Hexachloride) • HETP (Hexaethyl Tetraphosphate)*

for TERMITE CONTROL

ELIMINATES OFFENSIVE ODORS

TERRA TOX



Vulnerable areas are effectively protected by scientifically formulated TERRATOX • • • • •

TERRATOX comes in two formulations, water and oil soluble, and with the improved formula, your customers may be assured of application without the lingering association of unpleasant odors.

COST ECONOMY: TERRATOX is shipped only in concentrated form—you add your own thinner—this means significant savings in freight charges, and storage costs. Supplied in 1 and 5 gallon cans, and 30 and 55 gallon steel drums.

TERRATOX CONCENTRATES #225, #235, and #245 (oil soluble) are scientifically formulated with a toxic base of pentachlorophenol. Concentrates are so proportioned as to produce 5% of penta in the ready-to-use solution when mixed at the recommended dilution. According to U.S. Government tests (U.S. Dept. of Agriculture Bulletin #1911) this solution properly applied should give protection for at least five years.

TERRATOX #215 is water soluble and unsurpassed for its outstanding effectiveness in controlling dry wood termites. It has also proved equally effective for ground treatment in the control of subterranean termites.

Wood Treating Chemicals Co.

5137 SOUTHWEST AVE. ST. LOUIS 10, MO.

BUT THERE'S A BETTER WAY TO STOP TERMITES

You could kill termites by turning some centipedes loose on them, but then what to do with the centipedes? A better way to save wood from these destructive pests is to use Chapman Penta Preservative. This is the wood preservative that contains pentachlorophenol. Thorough-going tests carried on over a period of years have proved that pentachlorophenol is extremely toxic to termites... and pest control operators find it simple to use.

Penta Preservative is clean, odorless, safe to apply. Because pentachlorophenol is virtually insoluble in water, and so will not wash out of the ground, Penta is a highly effective soil poison. Swab or spray wooden structures with Penta, as an extra safety measure. This versatile wood preservative protects the lumber against decay as well as termites. It's the same product so many wood treating plants are turning to, to protect poles and wooden products.

Pest exterminators can buy Chapman Penta Preservative in either concentrate or ready-to-use form. Write us immediately for free literature on termites and how to control them, and don't forget to ask for information on our attractive sales help for you.

CHAPMAN

CHAPMAN CHEMICAL COMPANY

Suite 1234, 333 North Michigan Avenue, Chicago 1, Illinois

PENTA PRESERVATIVE CONTAINS PENTACHLOROPHENOL, A PRODUCT OF THE DOW CHEMICAL COMPANY

Pests

and Their CONTROL

Exterminators, Fumigators, Termite Control Operators, Entomologists, Insecticide and Supply Manufacturers

COOPERATING WITH NATIONAL PEST CONTROL ASSOCIATION

JAMES A. NELSON, EDITOR AND PUBLISHER

PUBLICATION AND BUSINESS OFFICES, 1900 EUCLID AVENUE, CLEVELAND 15, OHIO

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"Contributed articles in this publication do not necessarily reflect the opinions of the editors. The editors invite discussions, comments and all types of literary material pertaining to pest control and pests from any person interested in the advancement of the field."

Published monthly by PESTS, 1900 Euclid Ave. Building, Cleveland 15, Ohio. Subscription $4.00 per year, 2 years $6.00, 3 years $8.50. Foreign countries, including Canada, 1 year $4.00, 2 years $7.00, 3 years $10.00. Publishers are not responsible for any unsolicited manuscripts. No manuscripts will be returned. All advertising copy and contributions must be in our hands by the 15th of the preceding month of the issue in which they are to appear. Three weeks' advance notice necessary for change of address. Both old and new address must be given. Entered as second-class matter November 15, 1945, at the post office in Kansas City, Mo., under the Act of March 3, 1879.

EDITORIAL

Biological Warfare

JAPAN USED bubonic plague against the Chinese on November 4, 1941, in the Chinese town of Changteh, dropping infective agents from an airplane. Six people died of plague and there have been sporadic outbreaks since then. The Chinese managed, however, to keep the disease under control.

Bruce Bliven, in a recent article in **The New Republic** on new germ techniques, states that experts responsible for preparing plans for possible warfare of this type share the view that it can be extremely damaging against any country, including those countries enjoying the advantages of a high-level of public health measures and sanitary precautions.

Commenting on the possible use of insects or rodents as vectors to spread disease, Mr. Bliven notes:

> "Diseases carried by such vectors as insects or rodents could be set going in various ways. Infected vectors could be smuggled into the country and released, or animals or insects could be infected with the germs inside a country and then set free under favorable conditions." . .
>
> "Against diseases carried by vectors there is no effective protection except general and continuous vigilance on the part of military and public-health authorities. Any outbreak of a disease should be met promptly with all possible measures."

There's not much doubt that Mr. Bliven would rate pest control high on his list of "all possible measures" to combat disease. And it is equally certain that, in the tragic event of a war fought in terms of disease germs, pest-control would be a first line of defense, as indeed it was declared essential in the last and characterized as second in line of defense.

Practical Demonstration

AT THE February meeting of the Professional Exterminators' Association of New York, perhaps one of the most progressive and respected groups in the industry, an incident occured, which, we believe, is worthy of note.

During a discussion on classified telephone directory advertising, a member arose who, without recourse to mentioning names, though not unmindful of the possible mote in his own eye, took exception to the phraseology appearing in the advertisements of one or two of the members of whose presence he was not aware. Following a spirited round-the-room exchange of views, the "offending" members, quite voluntarily and with commendable good grace, agreed to delete the phraseology from future advertisements.

A practical demonstration, we think, — if one is needed — not only of the benefits that accrue to association membership, particularly if meeting attendance is maintained, but, above all, of what can be accomplished in an atmosphere of common sense and good-will.

Rat Facts

EVERY YEAR in the U. S., rats destroy as much as 200,000 farmers could produce—some estimates say 265,000 farmers, or more than a quarter million.

Total rat population in the United States is about equal to our own; in rural areas they outnumber humans. They average 10 young per litter, and have up to 12 litters a year.

Trap records show rats may migrate four miles in a week. That's why united, community-wide, in fact nation-wide action is needed, in fighting them.

Best estimates are that rats and mice destroy 200 million dollars' worth of stored grain alone in a year in the U. S.—and that's at 1945 prices! One rat can eat and spoil more than 100 pounds (two bushels) of corn a year.

A rat can eat and destroy up to 150 pounds of chicken feed a year, enough to feed two laying hens producing 140 eggs each. Where there is a real rat infestation on a poultry farm, they have been known to kill 1500 baby chicks in a night and carry off 80 dozen eggs in a week.

Livestock often refuse to touch the feed which rats have contaminated—a larger amount than what the rats actually eat.

By carrying disease, the rat has killed more human beings than all the wars in history combined. He prefers human food and human shelters; he stays around, with his fast breeding fleas—the direct carriers of bubonic plague, which killed 25 million Europeans in the Middle Ages, and of endemic typhus fever, which has been gradually increasing in Florida. Rats also carry infectious jaundice, rat-bite fever, dysentary, trichinosis, food poisoning, rabies, and possibly infantile paralysis.

Veterinarians report diseases and losses of livestock are more prevalent on farms where rats are present. They name white scours of calves, mastitis, ringworm, tuberculosis, contagious abortion, cocidiosis and infectious bronchitis of chickens, and trichinosis of swine.

"The rat", says the Fish and Wildlife Service, "is still mankind's greatest enemy in the animal world".

In Florida as a whole, according to State estimates, 75 per cent of the rats are infected with typhus fever.

As many as 281 rats have been taken from a single system of burrows under one small chicken house.

Rats usually eat only the germ of the corn kernel, polluting the rest so that is is unfit either for seed or feed. Similarly, in apple storage places, they cut into the apple to get at the seeds.

"Food poisoning, sometimes incorrectly referred to as ptomaine poisoning, is usually caused by infection with Salmonella organisms . . of animal origin and frequently found in house rats, which transmit them to human food."—**U. S. Fish and Wildlife Service.**

Rats destroy, each year in the U. S., one-third the whole quantity of grain needed this year for European relief.

New rat poisons and technique enable about 90 per cent control with one baiting if properly carried out on an area basis. Unless the campaign is continued new rats come in.

A new 10-ounce feed bag costs 30 cents, according

to New Jersey Extension Service; a good used one is worth 21 cents; a bag damaged by rats becomes a scrap bag worth only 2 cents. In New Jersey this is estimated to mean 700,000 scrap bags out of 7 million bags used a year in the State.

Thirty rats eat and waste enough dairy ration to feed a cow for a year. Cows will refuse feed that rats have contaminated.

The cost of living has gone up for rats too. But the human host pays the bill.

Harold Gunderson, Iowa State College rat specialist, has worked out a widely copied plan for estimating a farm's rat population.

It goes by sight. If the rats are never seen but rat signs are visible, there are from 1 to 100 rats. If rats are seen occasionally at night the number is 100 to 500. If they are seen every night and occasionally by day, total is 500 to 1000. If many are seen at night and several every day, population is 1000 to 5000.

— *AIF News*

Report of the Advertising Committee

TO DETERMINE the extent of unprofessional-like claims made by PCO's in their classified telephone directory advertising, the Advertising Committee of the NPCA, early in 1947, checked through 300 advertisements appearing in 31 directories in as many major cities throughout the U.S.

Their findings were made part of the committee's annual report — a report subsequently presented by Myron Sempliner, its chairman, before the Philadelphia convention last October.

Briefly, these findings, which incidentally note other advertising defects as well, may be enumerated as follows:

1. Out of thirty-one cities analyzed only twelve use the heading of "Pest Control" and seven of these use other headings also; thus only five cities have lined up with this ten-year-old Association policy.
2. Out of the approximately 300 advertisements examined, 125 refer to insurance.
3. Thirty-three give undue emphasis to guarantee, the emphasis being considered undue when the guarantee is given a prominence comparable to the service itself.
4. Forty-six advertisements rely on superlatives such as "biggest", "best", "100%", etc.
5. Only three advertisements emphasize cheapness, however.
6. Fifteen advertisements use unsupported technical statements, i. e., statements of fact of a scientific nature not acceptable to non-commercial authorities.
7. One hundred and fifteen advertisements claim or imply governmental endorsement.
8. Eleven advertisements contain extravagant claims of results such as "positive," "not one failure," and the like.
9. Mis-statements of PCO experience. This, like promiscuous use of more than one name, was impossible to check without concerted committee action.

What's to be done about it? We don't pretend to know the answer, but the committee warns that if the industry is to avoid governmental regulation it must learn to regulate itself, and that such regulation must contain teeth to be effective. On the other hand, we are certain once the PCO realizes that this professional maturity and even his economic stability are in a measure judged by the nature of his advertising claims, he will seek to bring his copy in line, voluntarily.

Notice

Pests has been transfered to Cleveland, Ohio. More about the change will appear in the April issue.

Cooperation From Without

IT IS SURPRISING to learn from time to time how our industry receives cooperation from others who are indirectly interested in our profession through their interest in public welfare.

Recently in one of the large cities the Better Business Bureau made a call to check two or more operators who had treated some homes for termites. The work apparently was unsatisfactory and complaint had been made to the Bureau.

The question was asked by the Better Business Bureau "Were these operators members of the local and National PC Associations?" The answer was "No".

It was pointed out that the sooner the public learns to do business with firms who are recognized members of the industry, the better chance it will have to check up on such members and that the public would be better off to engage firms who are reliable operators and members of the Association. This speaks well for our NPCA and local Associations.

The time has come when our Association is looked upon as a clearing house for pest control operators, and it is to the benefit of every PCO to belong to his local organization and the NPCA.

It is high time for every PCO who is not as yet a member of the NPCA to realize that he is hurting himself and is losing business by remaining a lone-wolf.

We appreciate the splendid cooperation we recieve from the Better Business Bureaus throughout the country.

From LIFE'S "Letters to the Editors"

Fumigation Effective Only Against Dry-Wood Termites

"Sirs:

You should have pointed out that the West Coast fumigating technique of pumping gas into a sealed house (Life, Dec. 22) is effective only against dry-wood termites, which do not exist anywhere in the U.S. except in California and the Deep South. Termites who live in the temperate zone are different, and the method of exterminating them is also different. It is unfortunate that the name of the company (Guarantee Fumigating Co.) which was involved in the explosion of the house in Los Angeles is so very similar to our own company name. We have had dozens of telephone calls and letters from anxious people about the process we use. Our process does not involve fumigation and is absolutely safe.

E. R. Jennings
President

Guarantee Extermination Co.
New York, N. Y.

"The Jennings method: to cut the termites life line to the moisture of earth by putting an inedible sheet of metal at vulnerable points in the foundation of the house.—Ed."

Irene Miller

A telegram has just been received advising of the sudden death due to heart attack of Irene Miller, beloved wife of Jess M. Miller, Editor of "Pest Control and Sanitation." Mrs. Miller has always taken great interest in the affairs of the industry, a licensed operator in her own right, and was very active in the California "Lady Bugs" organization. Her loss will be keenly felt, especially nationally in that she had constantly entertained PCO's from all sections of the country. Our sincere sympathies have been expressed to Jess M. Miller and members of the family. The home address is 1631 No. LaBrea Ave., Hollywood 28, Calif.

Inspection of Test Buildings Treated for Termites On Barro Colorado Island, Canal Zone, Panama

By Thomas E. Snyder and James Zetek, Bureau of Entomology and Plant Quarantine,
Agricultural Research Administration, U. S. Department of Agriculture

BARRO Colorado Island, the Canal Zone biological area is now under the jurisdiction of the Smithsonian Institution. On this island, since its establishment in 1924, the Bureau of Entomology and Plant Quarantine has conducted varied tests of the resistance of wood preservatives to termites. Other experiments with woods that are naturally termite resistant, with poisons for fiber boards and fabrics, and for the insulation of underground wires and cables have also been conducted.

This island is covered with a tropical rain forest, and 45 different kinds of termites are present. Therefore, untreated wood is seriously damaged in a short time.

As part of the tests of wood preservatives, several buildings have been erected at the ends of trails on this island, of timbers which have been pretreated with chemicals. The first of these structures was erected in 1926 at the end of the Drayton Trail and is known as the termite, or treated-wood house. It is a frame building 16 feet square and 10 feet high, inside measurements (fig. 1), and was constructed of southern yellow pine timber by the American Wood Preservers' Association, in consultation with the U. S. Bureau of Entomology. The foundation piers and framework had been impregnated with coal-tar creosote, the absorption being 12 pounds per cubic foot of wood (full-cell process) in the piers and 8 pound (empty-cell process) in the framework. The remainder of the woodwork and furniture (one table and four chairs) had been impregnated with ½ pound of zinc chloride per cubic foot. The normal recommendation would be 1 pound of zinc chloride, which in general would give considerably better results. The treated woodwork has been kept painted a battleship gray. The insulation, or fiberboard, had been given a light surface coating of chlorinated naphthalene.

Although the building was erected 21 years ago, there has been no attack by termites on the treated wood. Considerable termite activity took place, however, in wood placed underneath the building as "bait" stakes, and periodic activity in tubes constructed by termites (**Nasutitermes corniger** Motsch. and **Coptotermes niger** Snyder) on the treated supports. The fiberboard ceiling, treated with chlorinated naphthalene, had been damaged by rain leaking through the roof and later had been attacked by termites and small stingless bees (**Trigonia** sp.' In 1937 this fiberboard was replaced with insulation board treated with chromated zinc chloride, the retention of the dry salt ranging from a low of 0.42 pound to a high of 2.23 pounds per cubic foot.

At the latest inspection, in February 1947, the entire building was found to be in excellent condition, except that some of the exposed steps were decayed and will have to be replaced. The posts at the front right and rear right facing the entrance had termite tubes built all the way to the roof. At ground level the tubes were occupied by live **Nasutitermes corniger,** but near the roof they were occupied by an ant (**Azteca** sp.), which

Figure 1. Building constructed of timbers impregnated with coal-tar creosote and zinc chloride at the end of the Drayton Trail in 1926.

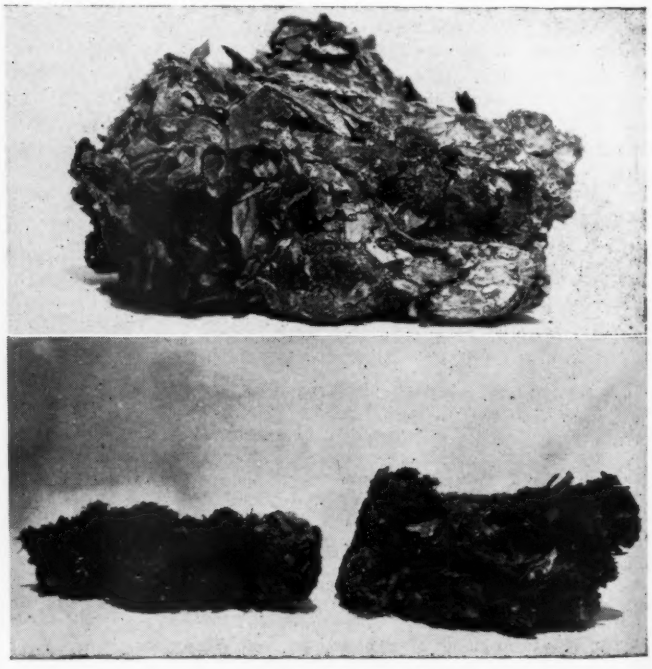

Figure 2. Nests of a leaf cutting bee (Euglossa (Eulaema) mexicana) on sills under house shown in figure 1.

With your chosen insecticide...

TIFA

IS THE IDEAL

APPLICATOR

DEATH-DEALING FOG FOR INSECTS

COMPACT, streamlined, mechanically improved, the 1948 model TIFA is more efficient, more economical, easier to handle.

Exhaustive tests have proved that TIFA does its work faster, with less manpower and materials.

A modern-day requirement for pest control operators, TIFA can be used for inside or outside work. A health necessity in recreational areas, on garbage and fill dumps . . . an effective tool on farms, ranches, dairies and in industry. Applies newly developed as well as older type chemicals *of selected particle size in a true fog.*

EFFICIENT . . . ECONOMICAL . . . PORTABLE . . . BUILT TO LAST. Put TIFA to work for you now . . . earns its cost and produces dividends in "no time."

TIFA

TODD INSECTICIDAL FOG APPLICATOR

Write for new circular.

TODD

A Product of

COMBUSTION EQUIPMENT DIVISION

TODD SHIPYARDS CORPORATION

81-16 45th Avenue, Elmhurst, Queens, N. Y.

18000

had evidently killed the termites and taken over tubes. The other seven posts also had termite tubes, but no live termites. On the outside of the building there were some **Nasutitermes** tubes on several siding boards just beyond the central post, but no live termites. No damage to treated wood was noted anywhere. Inside, the wallboard and strips, treated with chromated zinc chloride, and the table, chairs, and floor, treated with straight zinc chloride, were in very good condition.

In the upper left-front angle of the house was a large **Trigona** (stingless bee) nest with a pronounced cerumen spout. It was not disturbed, but there was apparently no damage to the wood.

A large number of nests of a leaf-cutting bee **(Euqlossa (Eulaema) mexicana** Mocsary) were also found "plastered" on the sills under the house and on the floor joists at the points where they rest on the sills (fig. 2). No damage to the wood was noted. On the north side a rather large aroid plant was growing on the roof.

Some idea of what would undoubtedly have happened to the wood in this test house had it not been given

Figure 3. Nests of a stingless bee (Trigona testacea cupira) on east outer side under roof of building constructed of timber impregnated with zinc metaarsenite.

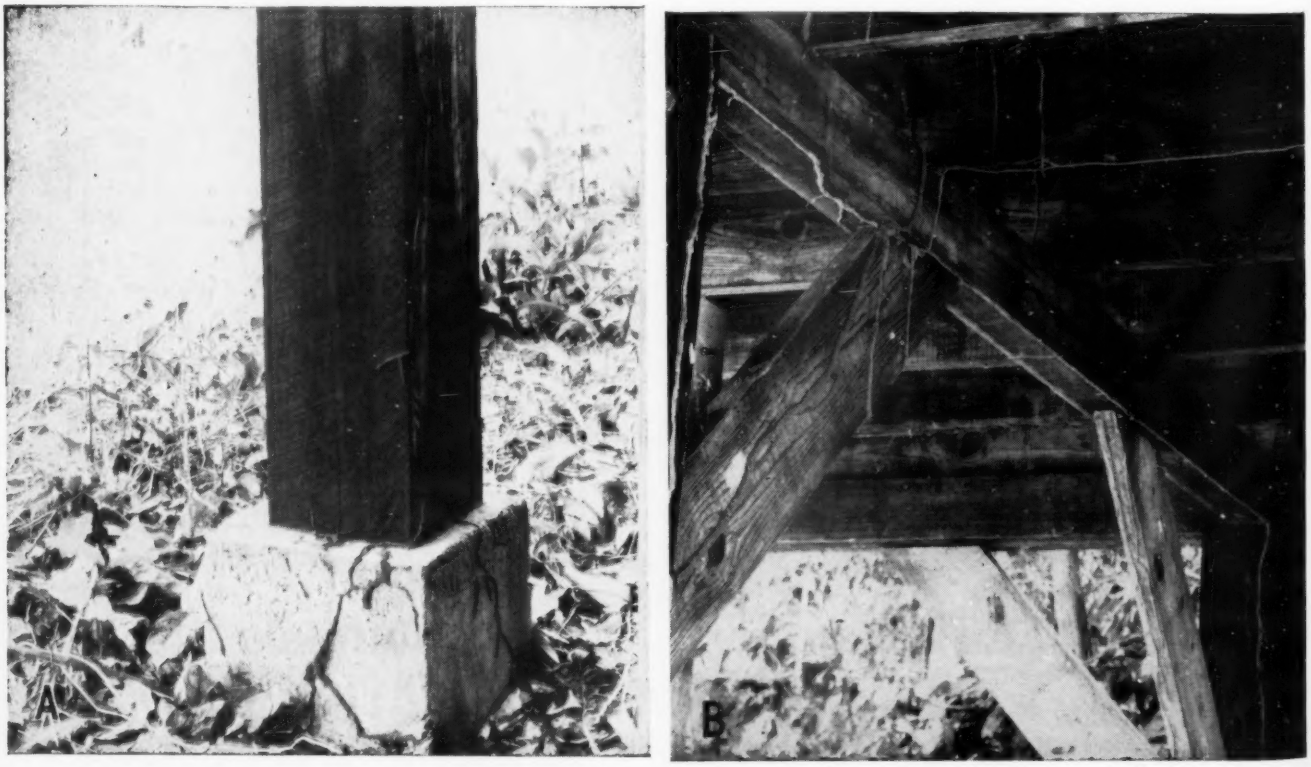

Figure 4. Tubes constructed by termites over foundations of concrete (A) and chemically impregnated timber (B) of building constructed in 1931 on Burrunga Point.

ANTU may be used effectively as a tracking poison or mixed with baits. Pictures show typical methods of application.

ANTU opens profitable new opportunities for PCO's

Recent official approval* of ANTU for use in confectionary and meat packing plants has opened new opportunities for pest control operators.

It is now possible to service these establishments easier and more satisfactorily because of ANTU's exceptional effectiveness against the common brown rat.

Other business opportunities

Officials point out that the rat population is now at its highest level . . . with estimates on the total number running as high as *five hundred million.*

This means that PCO's have practically unlimited opportunities to build new business, and expand their present services as well, especially among hotels, restaurants, office buildings, apartment dwellings and warehouses.

Cooperation with PCO's

As you know, Du Pont pioneered the production of ANTU. And right from the start, Du Pont has always made it a policy to work closely with the pest control industry to provide more effective tools for this important work.

Pest control operators who use Du Pont ANTU are assured of these plus values:

1. **ANTU that's chemically** and biologically tested.
2. **The benefit** of Du Pont's continuing research and development.
3. **Du Pont's continuing efforts** to open up new servicing fields for the pest control industry.

Du Pont ANTU is ready for immediate shipment. For full information, write to the Du Pont Company, Grasselli Chemicals Dept., Wilmington 98, Del.

NOTE: *While ANTU is not as dangerous to other animals as most rat poisons, it is a poison and should be handled as such.*

*Announced in Bulletin No. 8 (May 2, 1947) of National Confectioners' Association and Memo 52, Supplement 2 (March 17, 1947) USDA Meat Inspection Division. Copies of USDA Memo are available on request.

ANTU *for better rat control*

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

DU PONT

REG. U.S. PAT. OFF.

good preservative treatment is indicated by what did happen to unprotected cellulose-containing materials inside the house. The untreated wood in a little army cot placed in the house for use during early inspections had been reached by termites by way of shelter tubes built over treated wood. Termites were in the wood of the cot, and they were in the mattress and the pillows. Stored breakfast-food containers, paper, pencils, frames of mirrors,—in fact, any wood material not treated was attacked by them. The frequent presence of unoccupied shelter tubes was mute evidence of the effectiveness of the preservatives in preventing entrance of termites into the treated wood. Their failure to find edible wood at the end of the trail caused them to abandon the effort.

Another structure, known as the Fuertes House, is at the end of the Pearson Trail. It was constructed in Feb. 1931 in cooperation with manufacturer of wood pretreated with zinc metaarsenite. This frame building (12 by 16 feet) was built of southern yellow pine timber impregnated with 0.27 pound of the chemical per cubic foot. The furinture was likewise so impregnated, and insulation or fiber wallboard that had been treated with zinc metaarsenite was installed. The outside of the building was painted green.

After 16 years' service this building shows no signs of deterioration or attack by termites. Some corrosion of the copper screens, due to the use of chemically treated window frames, has necessitated their replacement with untreated fir frames. At the inspection made on February 26, 1947, all nine posts were free of termite tubes and showed no evidence of any in the past. The western red cedar shingles used for the roof are very badly rotted, in many places clear through, leaving open spaces through which rain water got into the attic and seeped into the room, rotting away the canvas of one cot, and also the mattress and the pillow One roof joist appears to be rotted at one end. It is imperative that the roof be replaced by one of corrugated iron.

Figure 6. Termite nest in cornor and damage to treated wooden floor of building on Burrunga Point.

The east outer side, under the roof, is covered with nests of **Trigona testacea cupira** (Sm.), and some are also on the front end and especially on the porch overhang (fig 3). These stingless bees seem to have done no damage to the timber, but to be sure of this, it will be necessary to kill them off and remove the nests.

The zinc metaarsenite treatment is holding up remarkably well, with no indication whatever of any termite activity.

The third structure is the Bangs house, on Burrunga Point. This frame building, 18 feet square, was completed in August 1931. The preservative was 5 per cent of betanaphthol in oil solvents, one of which was a colorless carrier for use where the treated wood was required to be clean, whereas the other carrier was dark and was in a heavy petroleum diluent. The house was built in cooperation with the manufacturer of the preservative and, except for the oak flooring, is entirely of southern yellow pine, impregnated with these preservatives, an absorption of approximately 3.9 to 5.5 pounds per cubic foot having been obtained. One table is of timber impregnated with this preservative. The wooden piers in contact with the ground and supporting the building were impregnated with the preservative in the heavy diluent. The siding, red oak flooring, and other woodwork used above the ground were impregnated

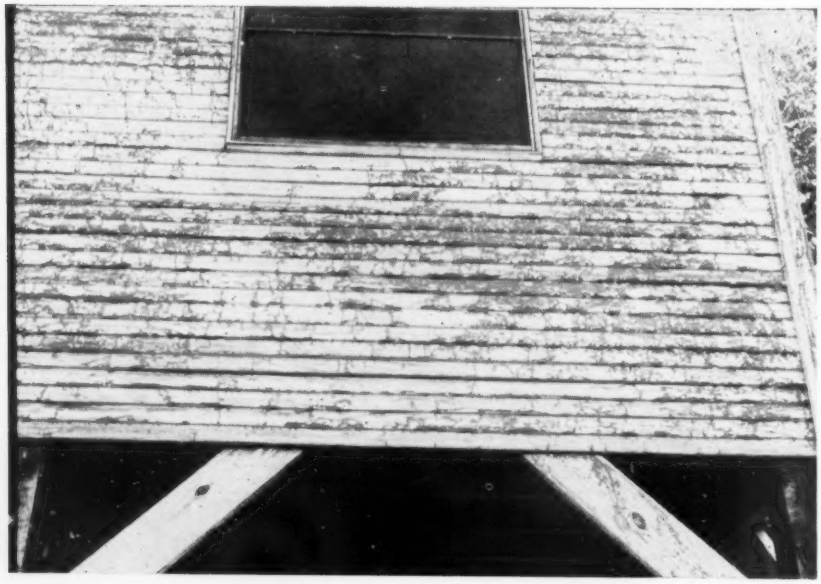

Figure 5. Termite tubes built over exterior of treated wood of house on Burrunga Point, Colorado Islands.

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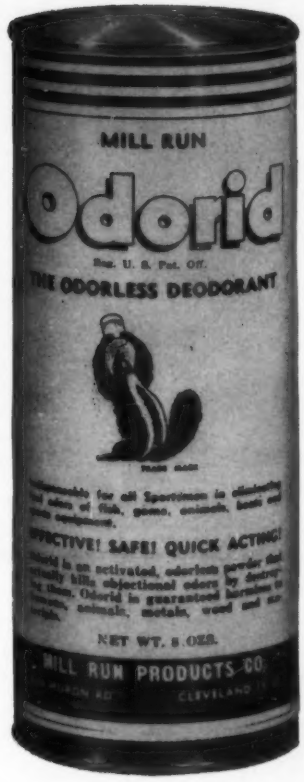

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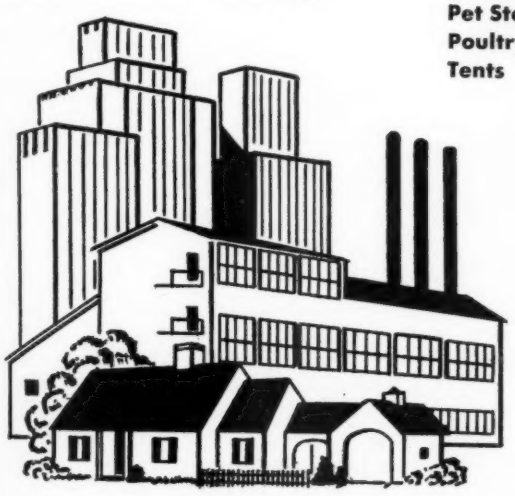

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Figure 7. Termite nest near middle of room in building on Burrunga Point.

carrier. The exterior of the building has been kept painted on two sides only.

A large number of termite tubes had been built on the supports of the building, and in May 1938 a termitarium, or termite nest, 15 inches high by 10 inches wide, was constructed in the southeast corner of the building, against the floor and two sides, by one of the subterranean termites, **Nasutitermes corniger.** At the inspection in August in 1940 the treated oak floor had been so severely damaged by both subterranean and dry-wood termites that it needed replacement. The steps and railing, with the exception of three of the treads, have all been replaced on account of termite damage and rot.

Figure 8.—Chemically treated flooring damaged by termites in building on Burrunga Point.

When inspected by the writers on February 26, 1947, the steps were badly rotted, and had we not brought along an extension ladder we would not have been able to enter the house. All posts, sills, floor joists, and the under part of the subflooring were covered with tubes of **Microcerotermes arboreus** Emerson (fig 4). The north and south walls, outside, unpainted, were literally plastered with termite tubes, which extended up to the very top of the house (fig. 5).

Inside, in the northwest corner, was a large termite nest of **Microcerotermes** (fig. 6), which was continued under the house. This termite had taken over the former nest site of **Nasutitermes corniger.** The nest was inhabited, and also present were ants **Dolichoderus (Monacis) bispinosus** Oliv., which unquestionably are keeping the termites in check. In the center of the floor was a smaller, new nest (fig. 7). The floor was badly damaged by termites (fig. 8).

As a test the treatment was a failure, since even in the posts the termites were able to cut grooves, and had it not been for the ants the damage would no doubt have been greater. Because of the ant population, no effort was made to enter the attic, but this will be done in the future.

It was decided to apply soil poi- with the preservative in the colorless sons about each of the nine posts, in order to control the termites. The top flooring must be replaced, and probably a corrugated iron roof installed.

It is evident from these experiments that chemical impregnation of wood will not protect the contents of a building from termites. Even if the preservative is effective, only the treated timber itself will be protected, and this will constitute no "shield of treated wood." Subterranean termites can and do construct earthlike shelter tubes over the treated wood to reach untreated material.

Initials Confuse; What Else to Use?

Initials like DDT were good at first but now are multiplying to the point of confusion, according to a protesting letter to Plant Disease Reporter.

"At one time," wrote L. Carl Knorr, plant pathology specialist on the Michigan extension staff, "initials effectively humanized many long-syllabled chemical names and made them stick in the layman's mind. Now they are making extension work increasingly difficult, leading to numerous inquiries from the field such as 'where can I get some DDD to clean up nematodes'?" Here is a partial list of initials as cited by Mr. Knorr:

BHC (1, 2, 3, 4, 5, 6, (hexachlorocyclohexane)
COCS (copper oxychloride sulfate)
DD (1, 2-dichloropropane and 1, 3-dichloropropylene)
DDD (dichloro diphenyl dichloroethane)
DNO (dinitro-ortho-cyclohexyphenol)
DDT (dichloro diphenyl trichloroethane)
DNOC (dinitro-ortho-cresol)
EDB (ethylene dibromide)
EDC (ethylene dichloride)
EDE (ethylene dichloride emulsion)
FDDC (ferric dimethyl dithiocarbamate)
HCCH (same as BHC above)
HCH (same as BHC above)
HETP (hexaethyl tetraphosphate)
MTDS (morpholine thiuramdisulfide)
PCH (piperonyl cyclohexenone)
PDB (para-dichlorobenzene)
TCP (dichlorophenoxyacetic acid and trichlorophenoxyacetic acid)
TMTD (tetramethyl thiuramdisulfide)
2,4-D (2, 4-dichlorophenoxyacetic acid)

Industry comment on the letter is that the name problem for new pest control materials is a four-way dilemma, with these alternatives:

1. The full chemical names.

2. Numbers, sometimes used when the product is first introduced. Their general use for commercial sales appears to be on the way out.

3. Initials adopted more or less spontaneously, like the list cited.

4. Agreement on a simplified name, as was done with Chlordane. This involves not only the manufacturers but the Federal enforcement agency, American Chemical Society, U. S. Public Health Service, Food and Drug Administration, American Medical Association, the entomologists and phytopathologists, and state enforcement officials.

Meanwhile each manufacturer will continue to devise his own simplified trade names, usually in the form of coined words, and fight to win such recognition for these that the buyer thinks of them first.

In labeling, the prospect is for continued use of the trade name to designate the product, and of either No. 1 or No. 4 in the ingredient statement,—AIF News, July, 1947.

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"FLIES"

JAMES D. WILLIAMS, Senior Sanitary Engineer, Illinois Department of Public Health

Editor's Note: Presented before the National Pest Control Association Convention in Philadelphia, October 27-29, 1947.

YESTERDAY your speakers told of the need for cooperation of the various groups interested in pest control. I am going to tell you of an actual case of that cooperation.

A few weeks ago, Mr. G. L. Hockenyos of the Sentinel Laboratories, in Springfield, called me and said, "Have you had any cases of poor fly control with DDT residuals reported?" I said, "No." He replied, "We and a number of associates have. We have looked into the possibility of faulty application and poor material and we don't believe that is it. Possibly we have found a DDT resistant strain of flies or a closely related species." The upshot of the conversation was that we decided to contact other persons and enlist their help. So far the following have started to work on the problem: Michigan Chemical Co., St. Louis, Michigan, USDA, Bureau of Entomology and Plant Quarantine, Mr. Hockenyos, Sentinel Laboratories, and our office. In addition, we have information through Dean G. M. Fair from Dr. Missirole, Professor of Malariology in the School of Public Health at the University of Rome, Italy, regarding a DDT resistant strain of **Musca domestica** which has been found in the delta of the Tiber River. The origin and special characteristics of this fly have not been determined; however, it is believed that the fly has always been present, but was given an opportunity to develop in large numbers by the absence of competing strains.

Information we receive from Dr. Knipling's office in the USDA showed that they were aware of the possibilities of DDT resistant species and had, two years ago, tried to locate and breed out in the laboratory a resistant strain of houseflies. They did not locate a truly resistant strain though considerable DDT tolerance was developed.

With cooperation and joint action of this kind all problems can be solved. Work on the atomic bomb was an excellent example. I feel that we have reached a time in insect control when an individual or one group cannot advance without the assistance and cooperation of other individuals and groups.

Flies Carry Disease

Flies are disease carriers; however, all species of flies do not transmit diseases, or transmit them to the same degree. The housefly, called **Musca domestica,** is probably of more importance than all other fly species in the United States. Its habits as well as its physical structure account for its importance as a carrier of disease. First, it feeds on human waste as well as on our foods. Second, it is covered with a number of fine hairs which pick up filth that may later be deposited on food. Disease organisms have been known to live for as long as 15 days in the fly and these may be deposited either through saliva which the fly produces to dissolve its food or in the fly's body wastes. As many as four million bacteria have been found on the body surface of a single fly and twenty-eight million in the gut of that fly.

With a knowledge of some of these dirty fly habits and structural peculiarities we can readily understand how it is possible for flies to spread diseases to man. The following is a partial list of the diseases which may be spread:

Typhoid fever
Para-typhoid fever
Diarrhea
Dysentery
Cholera
Anthrax
Diphtheria
Smallpox
Tuberculosis
Poliomyelitis (possibly)

Present research being carried out for the control of poliomyelitis indicates that the virus which causes the disease is found in abundant quantities in the feces of infected persons; therefore, it is reasonable to believe that flies are capable of transmitting this disease under certain conditions. We must, however, be careful not to jump at conclusions, for experimental work at Hartford, Connecticut, and Rockford, Illinois, during the last year, has shown that fly control during an infantile paralysis epidemic does not produce easily measurable results. We should, however, watch experimental work that is being carried on and assist whenever and wherever possible.

Know the Fly

I like to attack the problem of fly control as if each individual case were a special problem. In order to do this it is absolutely necessary to have a fundamental knowledge of the practical aspects of house-fly entomology. During the wintertime, in most of the United States, fly populations are very low and, in many cases adult flies are non-existant. The seed, so to speak, passes the winter as larva and pupa. In the spring, these emerge as adult flies and the summer's fly population is started from these few. The adult fly lays approximately 120 eggs, preferably in a damp, warm location containing plenty of organic matter and having an alkaline reaction. These eggs hatch in a few hours into larva. The larva stage lasts four to five days under optimum conditions and much longer under satisfactory conditions. During the last few days of the larva's existance, it has an urge to migrate to a cool, dry place where it changes into the pupa stage. The migrating urge is very strong for larva have been found to travel 50 yards from the fly-breeding area. Migrating larva crawl up sides of garbage cans, under lids and thus escape to dry cool areas adjacent to the cans. In the pupal stage the fly is in a brown case which has the appearance of a grain of wheat. As the name implies, food is not taken in this stage. After approximately five days the adult fly breaks open the pupa case and emerges. In emerging it may travel up through as much as eighteen inches of loose soil. Therefore, you can see the need of compacted soil over garbage-containing fly eggs. Upon reaching the surface, the fly must wait for its wings to become fully developed, a matter of ½ to 2 hours, before it can fly away. During this time it stumbles around much the same as the newborn of many animal species.

The adult fly will live only two to three days without food, but under ordinary conditions of temperature, humidity and food availability, will live several months, or the entire fly season. During that time the female may lay four or more batches of 120 eggs each; therefore, you can see why fly populations become high in a relatively short time.

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To orient our control work further, let us examine some of the characteristics of the adult fly. They have been found to travel as far as eight miles in a single day, with a maximum reported flight range of thirteen miles. These flights are modified by what the fly finds as it travels. For instance, if food and protection from the sun are found within a few feet or a hundred feet of the fly-breeding area, chances are the fly will not travel any farther. Odors, particularly food-cooking odors and odors from garbage and refuse attract flies and therefore are important factors in determining the fly's travel.

When in buildings, houseflies have a natural tendency to land on strings, light cords, corners of doors and other sharp edges. They usually do not prefer large flat surfaces unless temperature conditions make them preferable. Areas several feet above the floor level are preferred principally because of temperature.

Now for the practical application of this information. Let us pick out the weak links in the fly's life cycle and determine how we can use them to obtain satisfactory fly control: (1) The fly larva prefers a warm moist environment, with alkaline reaction, while the pupa needs a cool, dry environment. Why not attack the larva as it migrates? (2) Flies spend some time near the area where they have been produced before their wings are sufficiently strong for them to fly away. It is known that they are more susceptible to DDT at this time; therefore, let us orient our fly control to take advantage of this fact. (3) Adult flies land on strings and sharp edges. Let us give due consideration to treatment of such locations. (4) Fly larva can crawl up vertical and undersides of horizontal surfaces. Let us design and build garbage collection and storage facilities to take care of this situation. (5) Adult flies prefer warm surfaces. Let us treat these surfaces.

Planning For Control

We can have the best technical information, equipment and procedures in the world and yet fly control can be an impossibility unless we have a satisfactory working policy. The first step in establishing such a policy is that everyone be agreed that flies should be controlled and the extent to which they should be controlled. It is our feeling in Illinois that with the new insecticides, fly control should be preventive. In other words, DDT should be applied before the flies appear. The second point in establishing this policy is that everyone recognize and accept his responsibility in fly-control work; for example, a health department could accept the part of education, promotion, and demonstration, while pest-control operators could accept the responsibility for actual fly control.

In Illinois very little has been done on a state level in planning fly control. We are beginning to recognize, however, that people are not receiving the full benefits from DDT and other new insecticides; therefore, we are planning an expansion of our activities. Our first consideration has been the organization of a demonstration unit which, during the last year, treated a number of county fairgrounds and the State fairgrounds. It is planned that this demonstration unit will be used for promotional work in connection with restaurant sanitation and other sanitation programs. We hope that this demostration work will convince people of the need for fly control. That, however, is not enough, for funds are needed to carry on the work. We are now examining present legislation to see if any of it will allow taxation for fly control purposes. If so, we may see a number of districts organized which would have the option of doing fly-control work themselves or contracting pest-control operators. We feel that this would create a desirable situation based on competition. In other words, if the pest-control operator could do the work more economically than abatement district personnel, he would be hired. We have tested this theory at State institutions and find it satisfactory.

Keynote For Control

With the new insecticides, almost anyone by brute-strength and awkwardness can do a reasonably good job of controlling flies; however, the person who will make the best success at it is he who aproaches the problem with the background of the entomologist, with the analytical viewpoint of the engineer, and the action of the executive. I know that few of us can meet these qualifications, but all of us can improve our methods of attack by obtaining basic entomological information and applying it intelligently. Let us call this approach applied entomology.

Control the Fly

As I come to the section on the actual control of the house fly, I feel very much as a small boy surrounded by giants, for all of you have had much more experience in actual control work than I. All I can do is review briefly methods of fly control and open the session for discussion.

In spite of our many helps in fly control, sanitation must be the main stay. Garbage and refuse must still be properly handled and disposed of. Screening also is fundamental and should always be practiced. Fly traps have not proven satisfactory in general, and are used less and less each year. Electrified fly screens have an application under special conditions. In general, they have not obtained the popular support that it was thought they would in the beginning, possibly because they "throw too many flies into the soup."

As we all know, the great advances in fly control have appeared in the chemical field of insecticides. Whereas Pyrethrum was the only one we had a few years ago, we now have DDT and Chlordane which can be applied in a multitude of ways. Considerable research has been done in the field of fly larvicides with the result that benzene hexachloride and ortho-di-chlorobenzene were found to be satisfactory. Control of flies in the larva stage by chemcials, however, has many practical difficulties and therefore has limited value.

As an illustration of what I mean by applied entomology in fly control, I am going to tell of some specific fly-control problems. In 1943 I was in charge of sanitation at a camp of 1000 Brazilian rubber workers. This camp had not been completed and was without toilet facilities or satisfactory kitchen facilities. An investigation of the fly problem, and it was a problem, revealed that kitchen wastes were being disposed of on the ground adjacent to a temporary tent kitchen. The soil was saturated with organic matter and was wet and warm; in other words, an ideal environment for fly larvae. When the larva was sufficiently developed to pupate, they migrated away from the wet area to the adjacent dry soil, where they emerged without difficulty. To make matters worse, the sanitation squad at the camp removed the damp earth, with its larva, every other day. This earth was deposited on a dump where it dried out, and the larvae changed into pupa. The sanitation squad provided the transportation for the fly larva to migrate and, in effect, were operating a fly hatchery. At that time DDT was not available and the problem was solved by satisfactory disposal of kitchen wastes and other wastes.

At another camp similar to the one previously mentioned, a fly problem existed only in the kitchen. This kitchen was a permanent structure made of tile with glazed tile walls

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and a tile floor. The joints in this floor were disintegrating and in one place were found to be completely gone for a distance of about 20 feet. In this opening, which was approximately 2 inches deep, sufficient organic matter had collected for fly larva to develop. The edges of this opening were sufficiently porous and dry for the fly pupa. Therefore, a small fly hatchery existed right in the kitchen. The solution of the problem was simple: repair the floor.

I previously mentioned the demonstration work which our Department did in Illinois, at the county and State fairs. Perhaps, you would be interested in hearing of that work.

We used a crew of four men and one power sprayer at the county fairs. Five per cent DDT emulsion, sprayed at the conventional rate of 200 milligrams per sq. ft., was used at almost all locations. This coverage was controlled by the appearance of the surface as it was treated. The crew's schedule brought them to the fairgrounds approximately a week before the fair started. Their instructions were to treat all existing structures and give particular attention to places in those structures where flies would be apt to rest. They were to survey the area adjacent to the fairgrounds and treat any area which would produce large numbers of flies; for example, a garbage and refuse dump. Small fly-producing areas such as garbage cans at private residences were not treated. You can see that a complete treatment of the fairgrounds was not obtained since many of the fair structures were temporary and erected immediately before the fair, or even during the first few days of the fair. To take care of this situation, we had men, with hand sprayers, do follow-up work. These men were attached to a group showing State exhibits and, therefore, could work this activity in without difficulty. The results of the initial DDT treatment were, in all cases, satisfactory and we could have dispensed with the follow-up work without ill effects.

Cost of Control

What did this program cost? Twenty-seven fairs were treated at an average cost of $285.79 each. 3,800,000 sq. ft. were covered at these fairs at a cost of $2.03 per 1,000 sq. ft. The approximate cost per fair admission was 0.95 cents. These compare with costs at the State Fair of $1.20 per 1,000 sq. ft. and 0.32 cents per fair admission. The entire differential in treatment cost may be attributed to traveling, lost time, hotel expenses, and all the other factors that enter into doing work at a distance from the base of operations. Actually, when traveling and other costs are subtracted, the cost of treating county fairs was the same as the cost of treating the State Fair.

DDT Application

We have discussed the why and where of insecticide application; now for the how. DDT residual treatment is usually applied at a rage of 200 mg. per sq. ft. which means that one pint of a 5 per cent solution, emulsion, or suspension, would be applied to 120 sq. ft. You must practice with measured quantities of material on surfaces of known size in order to recognize appearance of surfaces receiving the proper treatment. These surfaces should be of different materials for each presents a slightly different appearance as treated. Remember that any fogging as the DDT is applied means lost material, discomfort for the operator, and greater chance of DDT reaching surfaces which need not be treated or should not be treated. Preferably a nozzle giving a fan-type spray should be used. If properly designed, this nozzle will give almost a film application with very little fogging. However, it must be used with the proper pressure. The common tendency is to use too high pressure with resultant fogging. Cut the pressure down so that material just reaches the surface to be treated without large droplets falling out. My experience has been that pressure from 30 to 50 psi are best.

A great help in obtaining the best spray pressure is the use of a diaphram type valve. I have not seen this type valve on any sprayer in the U.S.A. but it is used extensively in Brazil. It consists of a rubber diaphram about 1½ inches in diameter that is forced over the material inlet opening, thus closing off the flow. Since the diaphram is actuated by both a screw and a plunger the valve acts as a pressure reducer while retaining its quick closing action. It can be repaired in a few minutes by inserting a new diaphram and is practically leakproof and trouble free.

In fly-control work residual sprays are usually applied several feet above floor level. This means that a spray nozzle with a long handle is needed. If the control valve is conveniently located, this introduces the problem of material dripping from the spray nozzle when the valve is shut. The best method of solving this problem that I have seen is the placing of a spring of loaded ball check valves in the supply line as near the spray nozzle as possible. The spring need only be strong enough to hold the liquid in the supply line. An excessively strong spring may reduce the liquid pressure.

We have discussed the sprayer nozzle but we have not said anything about the apparatus that is needed to deliver the spray material to that nozzle. This apparatus should be as simple as possible. It should be capable of maintaining constant non-fluctuating pressure. For residual spray work where nozzle pressure of 30 to 50 psi are used, a machine capable of producing 70 psi is ample. I prefer the pressure tank apparatus both for hand and power sprayers. The power sprayers should be equipped with agitators and should have pressure gauges, air relief valves, and convenient inlets and drains.

When necessary treat inside dwellings and restaurants; food, food preparation surfaces, food utensils, and varnished surfaces should be covered before DDT treatment is started. Cover cloths can be used for furniture and clean dishtowels or newspapers for dishes, food, etc. Windows should be protected for DDT is difficult to remove from glass.

I feel that these treatment difficulties should be overcome as much as possible by treating areas closer to fly's point of origin. Tracing back we find that most flies that enter buildings rest on or around doorways and windows first. And prior to this they spent considerable time investigating outdoor fly attraction areas to say nothing of the time spent at the point of origin. Know the fly you are trying to control and pick your points of attack.

Chlordane

Chlordane, known also at 1068 and Octa-Klor, is thought by some authorities to be more toxic to houseflies than DDT. In general, little is yet known about its toxic effect on man and animals. Experiments so far indicate that it may be somewhat more toxic to animals than DDT. It is applied as a 2 per cent residual spray which is about ½ the recommended dosage of DDT. It is reported to have a residual in buildings somewhat less than that of DDT. I suggest that you follow reports on this insecticide and in particular those reports of the USDA Bureau of Entomology and Plant Quarantine.

Aerosols

Aerosols can be used in fly control to handle those situations where residual treatments cannot be used, or where a miscalculation or late

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start in control work has allowed a large number of adults to emerge. Since preventive fly control calls on sanitation and residual insecticide treatments to play the major roll, aerosols will be used principally in emergencies.

Conclusion

In conclusion may I stress the need for everyone interested in fly control to join forces. The housefly, whose habits and form make it a most effective disease dispensing mechanism, depends for its very existence on division among the groups attacking it. Let us then study and solve the fly problems we find, applying the best technical information available to give effective and economical fly control.

FLY CONTROL DEMONSTRATION PROJECT, ILLINOIS COUNTY FAIRS 1947

Operational Data

Number of fairs sprayed	27	
Number of units sprayed	477	
Number of sq. ft. sprayed	3,774,349	
Gal. of concentrate used	835	
Gal. of emulsion used	2,967	*
Average sq. ft. per gal.	1,269	**
Man-hours on grounds	669	
Man-hours actual spray	426.3	
Man-hours consumed by equipment breakdowns and other causes	242.7	***
Man-hours on grounds supervision	167	
Man-hours travel to location	523	
Man-hours in extra travel	543.5	****
Man-hours consumed in travel	1,066.5	
Miles of extra travel	3,242	****

Salaries—including supervision of $500	$2,887.75
Travel expenses	1,135.57
Permanent Equipment 880.76 Less 30 per cent depreciation	264.23
Expendable cost—Misc. commodities, Gas, Oil, Freight, Tires, Tubes	998.63
Labor and repairs on equipment	970.00
Cost of DDT 835 gals. at $1.75	1,460.38
Total Expenditures	**$7,716.53**
Average cost per fair	$ 285.79
Estimated attendance*****	810,000
Estimated cost per person receiving public health protection	0.95 cents

18" Fly Grills used for Check fly Counts

Fly Index of 5 or less established as satisfactory control. No check counts of over 4 flies reported out of 510 grill placements.

Kankakee County Fair not included in spraying program.

Check Fly count as seen from one point:
75-100 flies on tent poles and light wires
50 flies on hog - 20 flies on and around food stand counters.

* 25 per cent DDT and 35 per cent isomer reduced to 7 per cent

*** Includes horse transfer - Waiting for tent erection, etc.

**** Includes travel in connection with equipment breakdowns, sleeping accomodations, return to headquarters.

***** All returns regarding attendance have not been received.

Cost includes state-wide travel expenses and equipment repair.

FLY CONTROL DEMONSTRATION PROJECT ILLINOIS STATE FAIR 1947

Number of units sprayed	115	
Number of square feet sprayed	2,152,916	
Square footage of control during fair	1,295,084	*
Gals. of concentrate used	985	
Gals. of emulsion used	3,448	
Average square footage per gallon	1,000	
Man-hours labor	1,792	
Supervision man-hours	280	
Salaries (Includes Supervision)	$2,146.35	
Permanent equipment 880.76 less 30 per cent depreciation	264.23	
Gas, ail, etc.	49.00	
Cost of DDT at $1.75 gal.	1,723.75	
	$4,183.33	
Estimated attendance	1,300,000	
Cost per person for fly control	$ 0.0032	
Cost per square foot treated	$ 0.0012	

*Includes retreated areas

DDT Makes Possible Delousing The World

Washington—Delousing the whole world is an entirely practicable project, declares E. F. Knipling of the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture. By a well-planned and concentrated attack, it is possible to make every kind of louse extinct as the dodo or the dinosaurs.

This was proved dramatically by the anti-louse campaigns of the recent war. First success was in the development of the methyl bromide fumigation method, for Army uniforms. Climax was reached when DDT powder was used on the entire population of Naples, stopping cold a louse-borne typhus epidemic.

Rats Color Blind

Rats are color blind, the United States Fish and Wildlife Service has discovered. Poisoned grain dyed a brilliant yellow to discourage birds has been used successfully to clear out spots infested with the prairie dogs in Texas, Arizona, Utah, Colorado, and New Mexico. There seems to have been no ill effects upon birds in areas where the poison was used.

"The Alerting of Mr. Pomerantz" Paul Muni Plays Lead Role in 'Cavalcade' Drama.

Pomerantz honored on Nation-wide program.

Charles Pomerantz

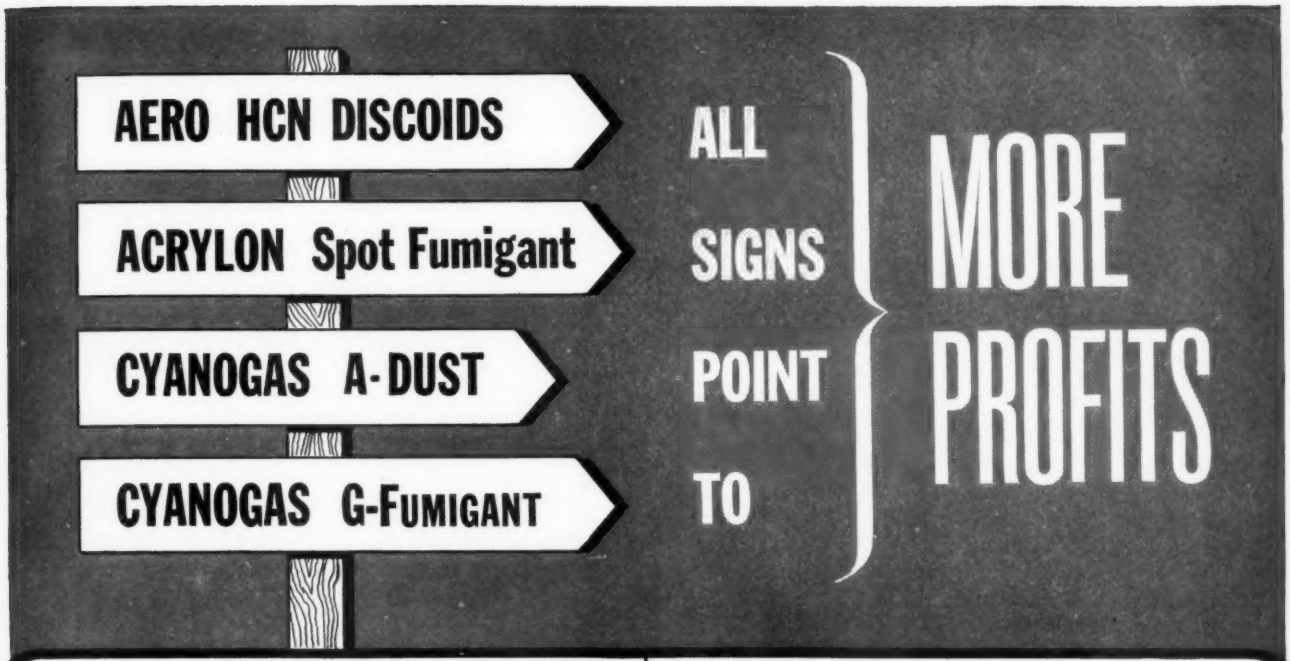
Paul Muni, star of stage, screen and radio, played the title role of Charles Pomerantz in Du Pont's Cavalcade of America program, "The alerting of Mr. Pomerantz," presented over NBC stations on Monday, February 16th at 8:00 p.m., EST. It was an eloquent and heart-warming dramatization of the true story of an amateur scientist who applied his knowledge of pest control to help solve the problem of a new and previously unknown type of fever, now called rickettsialpox.

In the summer of 1946 a new type of illness broke out in a medium-sized American suburb. Local doctors and the U. S. Public Health Service set to work immediately, and found unexpected aid from Charles Pomerantz of the Bell Exterminating Company, New York, who regarded his work as more than a job. He knew the control of pests was a vital service to his country. Long a student of mites and ticks, he was sure that he knew what was causing the spread of the mystery fever, despite objections and doubts of others.

Pomerantz rushed to Washington with his theory. It made good sense and he was asked to return to the infected area and set up a field laboratory. Cavalcade's February 16th drama revealed the race against time of Mr. Pomerantz and Doctors Robert Huebner and William Jennison of the U. S. Public Health Service, and how modern scientific methods and a hunch which was not without its roots in knowledge, defeated a new and dangerous enemy to the health of our country.

Following the broadcast, Mr. Pomerantz addressed a few words to the theatre audience in which he took occasion, as he never fails to do, to give full credit to Massachusetts State College, Purdue, Rutgers, Fordum, Montreal, and other universities for the courses they sponsored in conjunction with the NPCA which made it possible for him to acquire the basic knowledge of mites, ticks, etc. Above all, he paid gracious tribute to William O. Buettner, secretary of the NPCA, his mentor, "and without whose inspiration any contribution of mine would have been impossible."

The script by Paul Peters was a radio adaptation of the story "The Alerting of Mr. Pomerantz" by Berton Rouche, which appeared in The New Yorker of August 30, 1947.



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Powder-Post Beetles In Canada

By E. B. WATSON*

POWDER-POST beetles are the insects generally responsible for the boring damage to hardwood lumber in warehouses, lumber-yards, wood-working factories and private dwellings. The grubs of the beetles burrow in the solid wood and frequently reduce it to a crumbling powdery mass which can be easily broken up by hand. The first signs of injury are the appearance of small holes in the wood and piles of fine white or light brown flour-like powder coming from the tunnels.

Powder-post beetles are now widely distributed in Europe, North America and elsewhere; they will breed in most of the commercial hardwoods, although oak, ash, and hickory are more heavily attacked than any other kinds. Softwoods, such as pine, spruce, fir, cedar, etc., are immune and even in the susceptible varities, of hardwoods, **it is only the sapwood which is effected;** this is important, as the degree of injury to lumber in warehouses can be reduced by separating stocks containing sapwood and those composed exclusively of heartwood.

Life-history

Under natural conditions, the beetles appear in May and June and lay their eggs in the pores of the seasoned sapwood. Small whitish grubs hatch out and commence to tunnel in the solid wood; each grub works more or less independently and as it increases in size, the tunnel also becomes larger and is filled with the fine dust which is really the undigested part of the wood. The winter is passed as a partially grown grub; in the open there is no activity whatever, but in heated houses and factories, the grubs may continue to feed in the wood. In spring grubs are full grown and change to pupae and shortly afterwards into adult beetles. The latter are slender, flattened insects, about 1/4 inch in length and brown in colour. On emerging from the wood, the females mate and lay their eggs to continue the life-cycle once more. The beetles fly readily and can thus spread into uninfested stock.

*Contribution No. 2512, Division of Entomology, Science Service, Department of Agriculture, Ottawa, Canada.

Prevention

All authorities are agreed that it is sound business policy to take all necessary steps to prevent the beetles from becoming established in the lumber yards and warehouses. Direct control is costly and apart from the heat treatment, the results are uncertain. The following precautionary measures do not involve any appreciable expenditure, but if followed regularly and thoroughly, would undoubtedly be the means of saving large quantities of valuable lumber from becoming severely damaged.

Fig. 1. Block of hardwood showing holes through which adult powder-post beetles have emerged.

1. Separate stocks of wood according to species, keeping the sapwood separate from the heartwood.

2. Inspect all stocks of sapwood lumber (oak, ash, hickory) at least once a year, preferably in the fall. Small holes in the sapwood and little piles of fine white dust coming from the tunnels are sure signs of an infestation.

3. Use old stock first.

4. Avoid the accumulation of odd pieces of sapwood lumber which may not be utilized for years; in other words, clean up the yard or warehouse.

5. Use softwood lumber for piling sticks and all structural work in the warehouse.

6. Powder-post beetles will breed in the manufactured article as well as in rough or dressed lumber. Wood that has received a coat of paint, varnish, shellac, boiled linseed oil, or wax will not be affected. These substances fill the pores and prevent egg-laying by the female beetles. It should be mentioned that none of these materials will kill the grubs which may already be working in the wood.

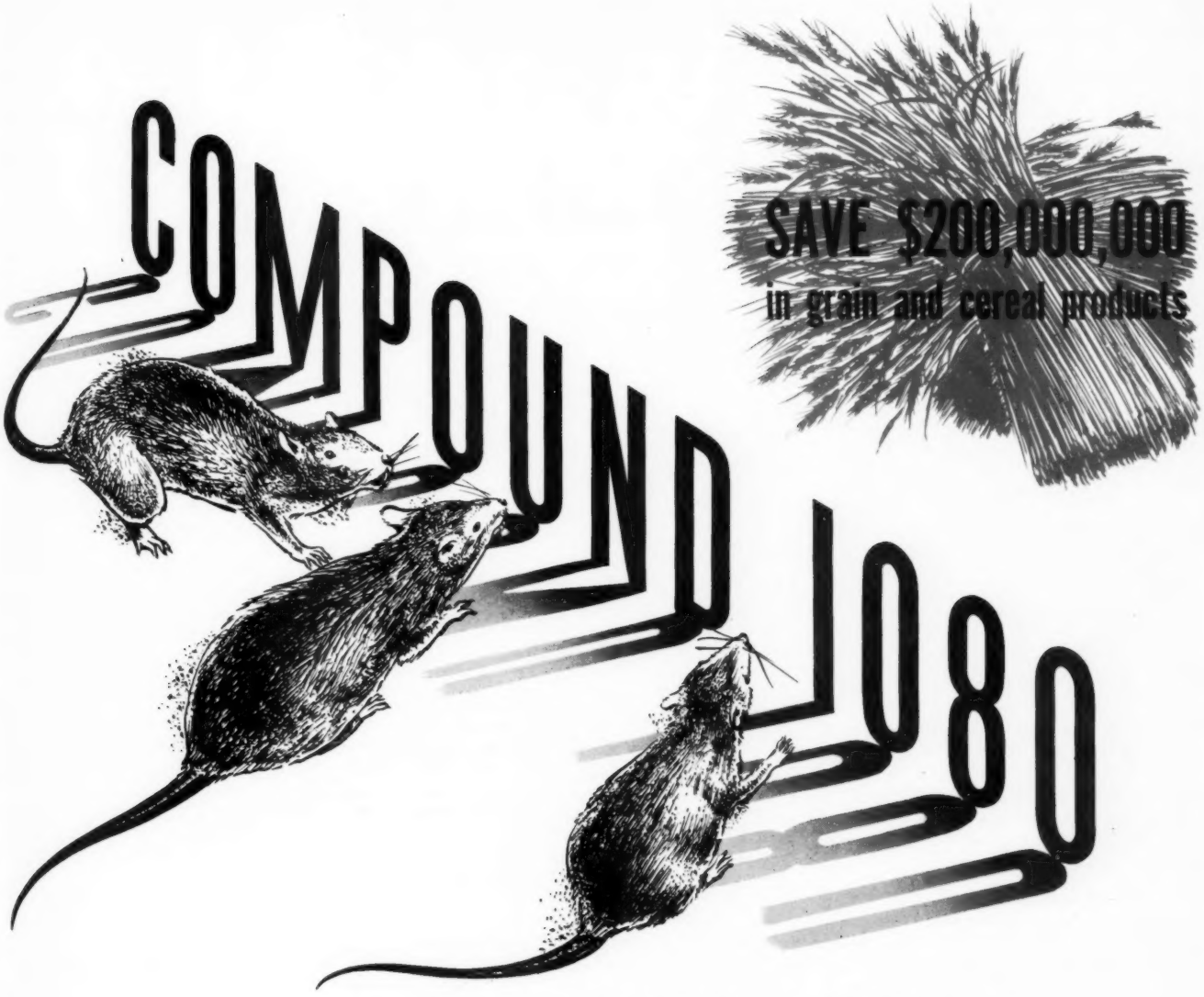
Direct Control

1. Burn all infested stock that is not of sufficient value to use or to treat.

2. Treat lightly infested wood (or lumber that is in close contact with infested wood) in a kiln. Stack the wood in the kiln and bring the temperature up to 130°F. This temperature must be maintained for 2½ hours for one-inch boards, adding two hours for each additional inch in the thickness of the wood. The humidity in the kiln must be maintained as close to 100 per cent as possible. This treatment will kill all stages of the insect in the wood **but will not prevent re-infestation.**

3. It is difficult to destroy the grubs in the wood by insecticides in one single application. The insects are well protected, as the dense plugs of dust in the tunnels prevent to some extent the penetration of insecticides. Some authors however claim that ordinary coal oil or kerosene applied to the surface of the infested wood, will penetrate the galleries sufficiently to destroy the grubs. The addition of paradichlorobenzene to the oil has also been recommended; this is a white crystalline substance obtainable from any drug store, and is widely used to destroy clothes moths in trunks and closets. Another preparation consists of creosote-one-part, and kerosene-three-parts; it is possible however, that this might cause a certain amount of discoloration and would therefore be objectionable.

Within recent years two materials have been used with success for the prevention and control of powder-post beetles. A 3 per cent solution of pentachlorophenol in kerosene has been effective in destroying all stages of the beetle and residue will also prevent re-infestation. A 3 per cent solution may be prepared by dissolv-



One sure way to increase the supply of grains for human food is to stop feeding it to rodents. Their annual "take" of stored grain and cereal products is estimated at $200,000,000 — a loss that can be controlled by eliminating these destructive pests.

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ing 3 lb. pentachlorophenol in 10 Imperial gallons of kerosene to which has been added one half-gallon of pine oil. Some commercial firms manufacture 5 per cent solutions of pentachlorophenol. This substance has the additional advantage of being a fungicide as well as an insecticide. A 5 per cent solution of DDT in kerosene is also recommended as a control and the residue may be relied upon to prevent any future attack over a period of several years. Any

Fig. 2. Block of hardwood split to show tunnels made by the beetle grubs.

articles treated with insecticides and subsequently painted or varnished will be free from re-infestation for an indefinite period.

It will be noted that all these preparations have a kerosene base and there is consequently the added risk of fire. These insecticides therefore should not be used in factories or warehouses; they would be useful, however, for the treatment of lightly infested woodwork in houses or for small manufactured articles.

It is advisable to treat or otherwise dispose of infested stock during the winter months, so that the insect population will be destroyed or reduced to minimum before the flight of beetles takes place in May or June.

Fumigation is not a practical method of control as the gases cannot penetrate sufficiently into the galleries to kill the grubs.

Control of Powder-Post Beetles in Dwellings

It frequently happens that lightly infested hardwood trim is used in the construction of houses. Within a few months, the beetles eat their way out, leaving unsightly "wormholes" in the wood surface. Re-infestation of the woodwork may continue especially if the varnish or shellac has not been properly applied and the beetles may also reach untreated wood by entering the cracks between the plaster and the wood. Control under such circumstances is sometimes difficult. Badly injured woodwork should be removed and burned. The more lightly affected parts should be thoroughly drenched with the pentachlorophenol or DDT solution referred to in paragraph 3 **"Direct Control"**, taking care to force the liquid into all the cracks and crevices of the wood by means of a brush or small hand sprayer.

Notes On 2,4-D

HEBER C. DONOHOE, Research Director, William Peterman, Inc.

THE ENTHUSIASM for weed control with 2,4-D is reminiscent of that for DDT and other new insecticides. Fortunately, it hasn't yet soared to quite the same flights of fancy, but even so it is being abused rather widely, and a considerable amount of misinformation still finds its way into the public press. I am no expert on the subject, but have followed developments in the literature, have had opportunity to observe its use in agriculture, and have applied quite a few small scale plot tests at home. From all of this I may be able to write a worthwhile story for **Pests.**

There's no point reiterating the history of 2,4-D's development for it already has appeared in print countless times. Suffice to say that 2,4-dichlorophenoxy acetic acid and various derivatives thereof have been proven to be highly effective in the destruction of many species of harmful weeds. For the Pest Control Operator who is threatened with loss of many formerly important means of revenue because of the high effectiveness of new insecticides, weed control may be a valuable new scource of revenue. A member of municipalities, including New York City, are attracting attention by their ragweed destruction programs. This type of public service for the benefit of hay fever sufferers is apt to grow enormously, and the alert PCO should be able to assume leadership in the program just as he now does in the rat control programs in many cities.

In addition, the experienced operator supplied with portable equipment and charging reasonable rates should be able to develop an excellent amount of custom treating for private homes, playgrounds, vacant lots, grounds of industrial plants and institutions, even in the more thickly populated areas.

Forms of 2,4-D

The acid form, unaltered, is so sparingly-soluble as to be impractical for use. Government and industry scientists have been highly successful in developing derivatives from the acid which are effective. These to date include at least (1) sodium and ammonium salts for water dilution, packaged as powders, or mixtures, just prior to use, of the acid with bicarbonate of soda or other alkali; (2) liquid esters of the acid which emulsify in water; and (3) water soluble liquid alkanolamine salts (tri-and diethanolamine salts). The esters are reported to be more effective than the salts due to their oils and wax soluble properties which facilitate absorption into the leaf wax and thence, presumably, into the living plant tissues. On the other hand investigators have reported somewhat more injury to desirable turf plants from esters than from 2,4-D salts. Much work is being done with 2,4-D dusts for application dry and these probably will be widely used agriculturally in the future. Drift from dust in treating small urban areas (yards, gardens) is a real danger to susceptible ornamental and garden plants. 2,4-D in lanolin or other viscous base shows interesting possibilities for killing freshly-cut-brush and tree stumps to prevent sprouting. This can be applied by brush or daub. Many further developments undoubtedly are in the "blueprint" and field trial phase but not yet reported.

2,4-D Application

So far as I know, all manufacturers of 2,4-D make recommendations for dilution and application. In general these are reliable for they are based on the combined experience of State, Federal, and industrial research. The standard application of the chemical 2,4-D or its derivatives, regardless of the formulation, is at the rate of 1 1/4 pounds per acre or about 1/8-ounce per square rod. Applied at this rate, with favorable weather, 2,4-D is highly selective and will kill many broad-leaf plants with

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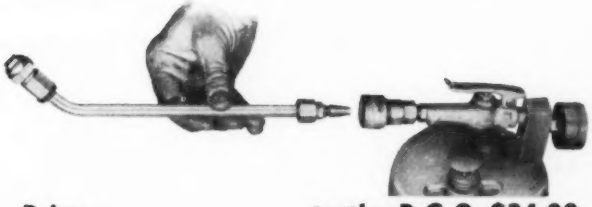

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little or no injury to grass. Quite often a second treatment is necessary to achieve maximum results. With poison ivy, bind weed, Canada thistle and other deep rooted perennials, treatment at twice the standard rate, with sacrifice of any grass involved, has given variable but generally good results.

Success of 2,4-D treatment is least when applications are made during cool, damp weather or to plants that are past the bloom stage. Plants in active vigorous growth, including sprouts from cut stems or trunks, are most susceptible. Applied to foliage, there is no effect on germination of weed seeds in the soil. Since these can live for as much as 40 years there is no present possibility for permanent weed control and at least annual retreatment appears essential.

Spray equipment delivering a coarse spray at low pressure (40 lbs. and under) appears to be more efficient than fine sprays at high pressure.

Cautions

2,4-D is injurious to desirable lawn plants other than grass (chiefly clover), and has reportedly severely injured Bermuda grass lawns.

The chemical is highly injurious to most ornamental and vegetable plants, even in extreme dilution. Avoid spray or dust drift and never use a 2,4-D sprayer or duster for any other purpose.

Applied as a selective weed control to corn and other grains there is some evidence that injury of serious proportions will appear in the crop from seed of plants treated before seed production the previous year.

If you want to undertake custom 2,4-D treating don't use this article as the basis for your technical information. Consult your suppliers, your state experiment station, if possible the U. S. Bureau of Plant Industry at Beltsville, Maryland, and all of the technical and semi-popular reports you can. When you are sure you have an intelligent practical working knowledge and when you have the necessary simple equipment, and when you have conducted your own field tests, then look for business.

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The papers listed below are among those I have found helpful. There are many more. At this writing I am in the process of moving my office and everything is in such confusion that these are all I can locate.

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Food Waste in U. S. Homes Is Set at Billion Dollars a Year

Economic effect of waste is the subject of a discussion in the current autumn issue of "The Index" published by New York Trust Co. It places the food waste in homes at about $1,000,000,000 a year and annual losses from insect pests at about $3,000,000,000.

"While considerable progress has been made in overcoming some of the most costly of these wastes, the need for intensifying conservation efforts by individuals, industries, research and other organizations is greater today than ever before," it is added.

"Some of the natural resources of the nation now facing depletion cannot be replaced," the Index asserts. "These include metals and mineral fuels necessary in peace and war and their conservation is vital to national security."

"St. Peter, Here I Come"

The following, said to be on the reverse side of the business card of an Ohio chief of police, admonishes people to "Sing While You Drive":

At 35 miles per hour sing: "Highways Are Happy Ways."

At 55 miles per hour sing: "I'm a Stranger Here, Heaven Is My Home."

At 65 miles per hour sing: "Nearer My God to Thee."

At 75 miles per hour sing: "When the Roll Is Called Up Yonder, I'll Be There."

At 85 miles per hour sing: "Lord, I'm Coming Home."

At 95 miles per hour sing: "Open the Gates of the Temple."

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Replies to advertisements where box number only is indicated should be addressed **c/o PESTS, 1900 Euclid Ave. Building, Cleveland 15, Ohio, giving box number as well.**

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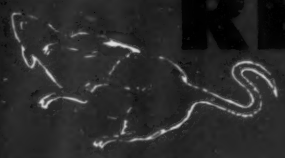


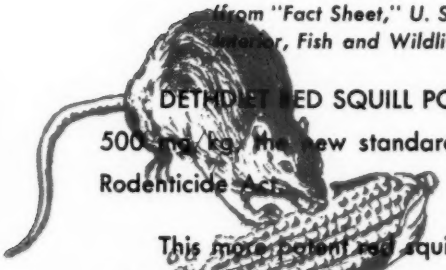
TO KILL RATS

A survey made last month of the state recommendations for rat control indicated that 95% mention and recommend the use of red squill in substantially the following words:

"Red Squill is the safest bait for use by the general public. * * *

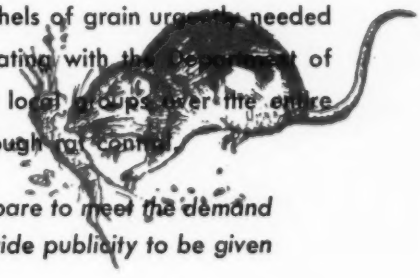
"Red squill (powdered) should be mixed at the rate of 1 part squill to 9 parts bait. Be *sure to obtain squill with a guaranteed strength of at least '500 mg/kg'*. Red Squill is the safest of all rat poisons and is very effective when properly used."

(from "Fact Sheet," U. S. Department of Agriculture, Cooperating with Department of the Interior, Fish and Wildlife Service, November 1947)



DETHDIET RED SQUILL POWDER and RODINE (liquid extract of red squill) assay 500 mg./kg. the new standard set up under the Federal Insecticide, Fungicide and Rodenticide Act.

This more potent red squill will serve in campaigns to reduce the rat population of the country. Last year rats destroyed 200 million bushels of grain urgently needed overseas. The U. S. Department of Agriculture, cooperating with the Department of the Interior, Fish and Wildlife Service and assisted by local groups over the entire country, is planning a broad conservation program through rat control.



Please write us for information on how you can prepare to meet the demand for red squill which will inevitably result from the wide publicity to be given these conservation measures.

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How Pest Control Operators May Obtain Publications

By ERNEST M. MILLS, U. S. Fish & Wildlife Service, New Brunswick, N. J.

MOST Government, state, and other bulletins or articles can usually be obtained easily and at small expense. Pest control operators are being provided more and more with bibliographies in manuals of the various conferences and Short Courses, Pests and Their Control, Pest Control and Sanitation, National Association Service Letters, and at the end of technical articles. It is often desirable to obtain copies of such information for details, clarity, and further references. Many Pest Control Operators are building reference libraries of their own. Although this article is not primarily concerned with how to locate information, suggesting guides to the literature, or methods of keeping-up-to-date with the literature, a few references will be given about indexes, catalogs, and price lists as these bear directly upon the subject at hand.

Government Publications

There are three agencies whose publications are of chief interest to Pest Control Operators, namely, the Bureau of Entomology and Plant Quarantine, the Fish and Wildlife Service, and the U. S. Public Health Service. All three agencies issue popular bulletins, technical bulletins or circulars, mimeographed information, and indexes.

In order to know the availability of new, recent, or old publications, it is suggested that one obtain or consult the various catalogs or indexes as follows. The Superintendent of Documents, Government Printing Office issues a "Monthly Catalog, U. S. Government Publications" by subscription at $2 annually. The U. S. Dept. of Agriculture has a "List of Available Publications" Miccellaneous Publications No. 60 (Revised to Jan. 1945) and may be obtained free from the Office of Information, U. S. Dept. of Agriculture, Washington 25, D. C. (The Bureau of Entomology and Plant Quarantine is under this Department.) The Fish & Wildlife Service issues a mimeographed Index of publications, Wildlife Leaflet 186, which may be obtained free from this agency, Merchandise Mart, Chicago 54, Ill. "Price Lists of Government Publications" are sent free by the Superintendent of Documents, Washington 25 D. C. Three such price lists of interest to Pest Control Operators are Price List 21, "Fish and Wildlife", Price List 41, "Insects", and Price List 51, "Health." The U. S. Public Health Service issues indexes from time to time, a six months index usually appears in their "Weekly Reports."

Popular bulletins or printed circulars of a general nature are the easiest to obtain. Such publications are "Farmers' Bulletins" of the U. S. Dept of Agriculture of "Conservation Bulletins" of the U. S. Dept. of the Interior Fish & Wildlife Service. When such bulletins are printed, an allotment is made between the agency preparing the material, the Government Printing Office, and members of Congress. One way to obtain such a popular bulletin without charge is to request a copy from a U. S. Senator or Representative. A copy may be obtained free by writing the agency which issued the bulletin but it is suggested that the request be sent in soon after publication before their limited supply is exhausted. A copy can be obtained also from the Superintendent of Documents in accordance with the Price List, usually about 10 or 15 cents.

Technical information is published in limited editions. Requests for free copies may be sent directly to the agency involved shortly after publication. Otherwise, it is usually necessary to purchase such technical publications from the Superintendent of Documents. Old publications are available only at second-hand book stores.

The procedure in obtaining publications of the Public Health Service, Bethesda Station, Washington 14, D. C., is about the same. Their information appears mainly in their "Weekly Reports." The more important articles are reprinted as separates. This agency has a Supplement and Bulletin series as well. Write direct to the Public Health Service for copies of the article to be sent free. One may subscribe to the "Weekly Reports" by remitting $4.00 annually to the Superintendent of Documents, Washington 25, D. C.

State Publications

The publications of interest to Pest Control Operators are published principally by the Extension Service or Experiment Station of the State College of Agriculture or University. In a few cases, a State Department of Agriculture may issue publications of interest, for example, California.

The general index to these publications is the "Experiment Station Record" which is issued monthly with a subject and name index every six months. It may be consulted at libraries or purchased for $2.50 annually from the Superintendent of Documents as it is compiled by the Office of Experiment Stations, U. S. Dept. of Agriculture. Each State agency usually issues a free index to their publications, revised, at intervals.

Periodicals

Much information on insect and rodent problems appears in monthly and quarterly periodicals known as "serials". It is usually more difficult to obtain such publications than bulletins or pamphlets. It is suggested that the periodical be consulted at a library to determine if the article is of sufficient interest to obtain a copy. If such library facilities are not available or if a copy of such an article is desired, there are several methods that may be employed.

Before considering the various procedures, some general statements should be made. Popular magazines such as **The Saturday Evening Post** do not usually provide reprints for their authors or otherwise. It is necessary, therefore, to purchase the entire periodical. The more technical and scientific publications usually provide their authors with a limited number of reprints. These are furnished gratis to the authors by some periodicals but others make a nominal charge. Very few publishers of technical periodicals maintain these reprints at their office so it is necessary to contact the author in order to obtain a reprint.

The least expensive procedure is to request the author to send a reprint suggesting that the applicant will forward any cost, including postage. Most every article shows the official connection of the author and may contain the complete address. If such a connection with address is not given, a practical method is to send 25c in coin to the publisher of the periodical requesting that it be forwarded to the author for a re-

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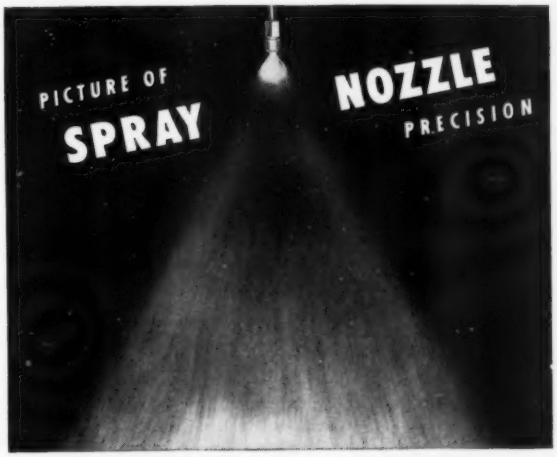

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WRITE FOR CATALOG 22

print. The business office of such a publisher or author will request additional payment if insufficient or make refund if an overpayment.

Another method is to purchase the complete periodical by sending the required amount to the business office of the publisher. The rate for an individual issue is usually found in the periodical. If the desired issue is not of recent date, the cast may be more than the regular published price or their supply may be exhausted.

In the case of older issues, obscure periodicals, or other difficulties in obtaining copies of such articles or reprints, certain larger libraries are equipped to furnish filmstats or photoprints. One such list of libraries can be found in Chemical Abstracts, Vol. 30, Nov. 20, 1936.

The Library of the U. S. Department of Agriculture will furnish photoprints for 50 cents for each 10 pages of text or fraction thereof of an article listed in their "Bibliography of Agriculture", a monthly publication.

Also it may be possible for your local librarian to obtain a copy of any periodical for consultation by research and other workers through the inter-library loan service.

Books

There is no difficulty in obtaining recent books as they can be ordered through your local book store if not carried in stock. Older books may often be found in second-hand book stores. Also books may be obtained for consultation through the inter-library loan service as described above.

Third Annual PCO Conference

University of Wisconsin, Madison, Wisconsin
April 1, 2 and 3, 1948

The University of Wisconsin, Department of Economics Entomology will present its third annual Pest Control Operators Conference at Madison on April 1, 2, and 3, 1948 Registration and some sessions will be held at the Loraine Hotel. **Practical demonstrations** on (1) rat control, (2) making of plastic mounts containing insects. (3) spraying equipment, and (4) insecticide evaluation methods will be carried out at other suitable locations.

The following program will be presented:

Thursday, April 1

Chairman ..... L. B. Kelly

10:00 a.m. — Registration
1:00 p.m. — Organizational Meeting
2:00 p.m. — Rat Control (Practical Demonstration) .....John T. Emlen
Sanitation
Survey
Bait Mixing (1080, antu, squill, thallium sulfate, arsenic, phosophorus, barium carbonate.)
Bait Placement
Ratproofing
Foot Pump Fumigation
7:00 p.m. — Wis. PCA Dinner and Business Meeting

Friday, April 2

Chairman ..... Harvey Klein

9:00 a.m. — Insecticide and Rodenticide Labeling....Federal and State..... E. L. Chambers
10:00 a.m. — New Custom Jobs.....R. J. Dicke and E. H. Fisher
Mosquito
Dairy Fly
Pea Silage
11:00 a.m. — Plastic Mounts.....Roy D. Shenefelt
12:00 m. — Luncheon ..... Crystal Ball Room
Address by Mr. Herbert Anderson (Milwaukee Health Officer) on "Sanitation In Relation to Pest Control Industry"

Chairman ..... Henry Turrie

2:00 p.m. — Insecticide Evaluation Methods.....G. S. Kido
3:00 p.m. — Uses For New Insecticides.....T. C. Allen
4:30 p.m. — General Insect Control Questions.....Staff
7:00 p.m. — Banquet .....Crystal Ball Room
Address by G. L. Hockenyos, President, NPCA

Saturday, April 3

University of Wisconsin Livestock Pavilion

Chairman ..... Johnson

9:00 a.m. — Weed control.....K. P. Buchholtz
10:00 a.m. — Spraying Equipment.....O. I. Berge
Weed Spraying
Essick Air Sprayer
Compressor for Lofstrand
Home-Made Compression Sprayer
Automobile Compression Sprayer
Nozzles
12:00 m. — Luncheon ..... Crystal Ball Room
Open Discussion Summary

We of the Department of Economic Entomology, University of Wisconsin, extend an invitation to PCO's and other interested parties to attend this conference.

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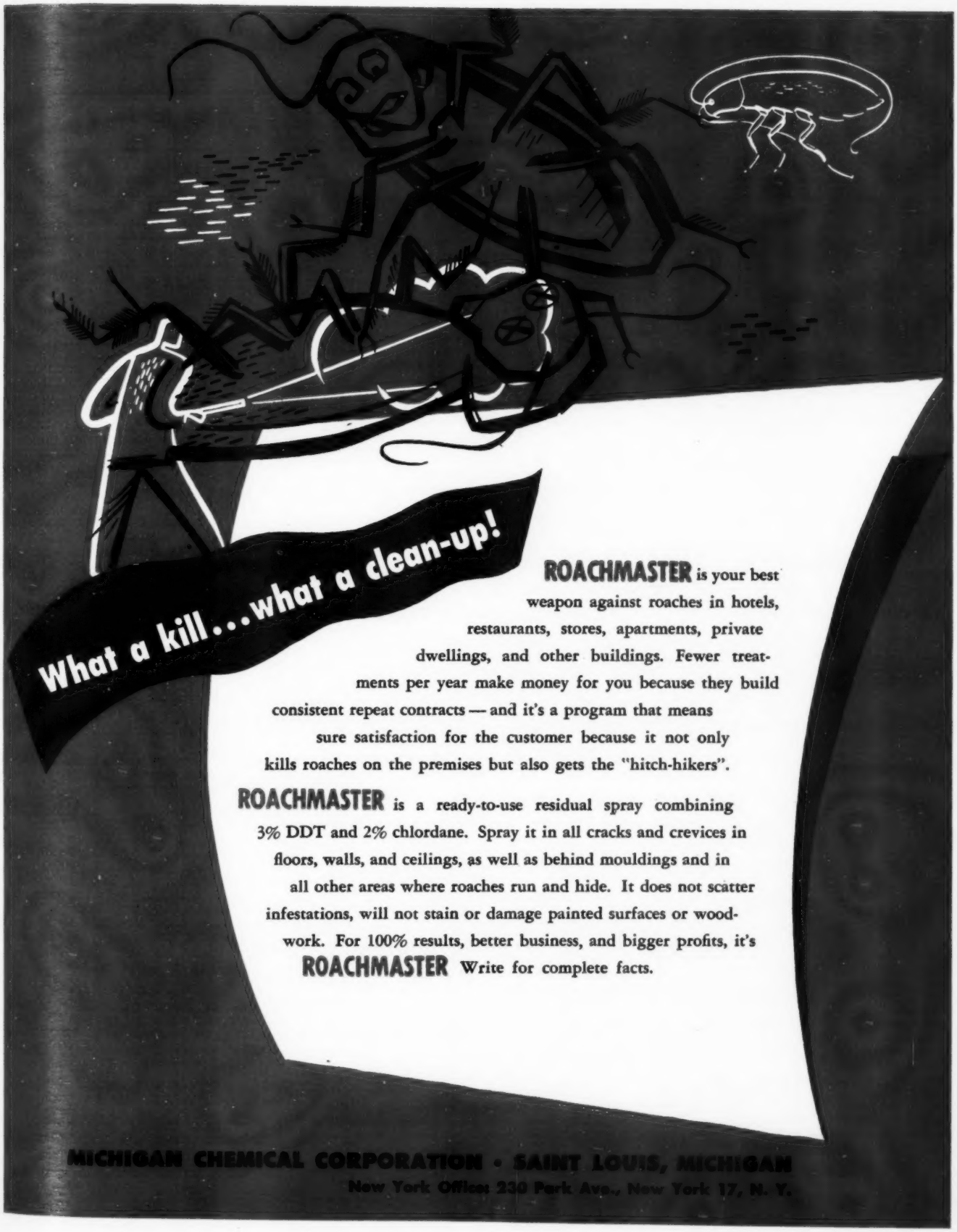
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Hazards Associated With Handling the New Organic Phosphates

Justus C. Ward* and James B. DeWitt**
*Pharacologist, Wildlife Research Laboratory, Denver, Colo.
**Chemist, Wildlife Research Laboratory, Patuxent Refuge, Md.

During the war a rumor was started that the Germans had developed a strange new chemical which could be sprayed over a column of troops—or a busy city—and every person touched by the material would be killed. The idea seemed to be too fantastic to merit a great deal of consideration, so when this spectacular chemical did not appear as an agent of warfare, the talk about it was soon forgotten. When the European phase of the war was over, however, some new economic poisons were found in Germany by scientific teams sent into the country by the various Allied Nations. Among the discoveries was a product called "Bladan", which, on chemical analysis was found to have a composition corresponding to that of hexaethyl tetraphosphate. It has been found to be very toxic to certain insects known to be quite resistant to DDT and other materials of that type. As a consequence, "HTP" was welcomed by entomologists of the United States as another new agent for the eternal war against insects.

In the experiments which were needed, however, before widespread use of this new substance could be undertaken, were those to determine the hazards to beneficial forms of life. When these studies were started it was found almost at once that "HTP" was highly toxic to laboratory rats. This discovery led the entomologists to suggest that the Fish and Wildlife Service try this German product as a mammal poison. One reason why that idea appealed to us was that "HTP" lost its toxicity when it was exposed to moisture. That characteristic was a desirable one, since it would be a distinct advantage to use a poison which would remain effective long enough for the pest animals to find it and be killed, and then become harmless soon enough to permit the operator to ignore any unaccepted residues of bait.

Two major lines of study were pushed at once, with different features being emphasized at the Wildlife Research Laboratories at Denver and Patuxent. In addition, samples of the new material were sent to cooperators at different points in the country. In the first project, an attempt was made to determine the practical utility of hexaethyl tetraphosphate, by evaluating its efficiency against its dangers; and in the second program, more effective substitutes for "HTP" itself were sought.

In the first part of the work, both Denver and Patuxent reported "HTP" to be toxic enough to laboratory rats to justify further attention, and so it was most interesting to receive from the University of Chicago Toxicity Laboratory the first sample of a related chemical, tetraethyl pyrophosphate, which is believed to be the active toxic material in "HTP". This product proved to be several times more toxic to rats than was "HTP" and as a consequence, it received preferential treatment in all future studies. Work soon showed that "TEPP", as tetraethyl pyrophosphate was called, had the same characteristic loss of toxicity in the presence of moisture, and its possible value in the rodent control field seemed obvious.

Both "HTP" and "TEPP" are heavy, syrupy liquids, which are readily miscible with water, and which can be blended with any type of solid food bait. The future of the organic phosphates in the rodent control field seemed to be promising—provided that further tests were satisfactory. To aid in the confirmatory studies, samples were sent to Mr. H. J. Spencer, Biologist, Wildlife Research Laboratory, Gainesville, Florida. Under his experimental conditions, TEPP baits were not readily accepted by the black species of rats. Stomach tube tests followed and these animals were shown to be somewhat resistant to this poison. About the same time, some of the material was mixed with steam-rolled oats and offered immediately to captive prairie dogs, ground squirrels and rock squirrels, Results were disappointing, a few animals ate enough to cause death, but most of them seemed to eat the bait without showing symptoms. These findings indicated that it would be well to limit the possible use of "HTP" and "TEPP" to the control of Norway rats—and perhaps, house mice.

Earlier enthusiasm began to fail, but the potential value of a new Norway rat poison dictated that the testing be continued. One evening, after an extensive bioassaying session, one of the authors did not feel as well as usual, so he began to think over the events of the day with a rather analytical attitude. The inevitable conclusion was that these organic phosphates might have had some part to play in his slight disability. The next day a rather extensive series of expermients was started to determine the toxicity of "TEPP" by skin absorption. Rat, mice, baby chicks and pigeons were used in various parts of this program.

At first, the danger to clipped rats was determined, and we were startled to find that we could not measure small enough doses to find just how little of the pure chemical it would take to kill. It was only when we mixed the poison with soybean oil at the rate of 2½ per cent "TEPP" that we were able to determine that 2.5 miligrams of "TEPP" per kilogram of rat body weight would kill in less than 1½ hours. That means that 0.5 milligrams will kill the average rat, and 0.5 milligrams is only 1/130th of a grain. One drop of TEPP weighs approximately 50 milligrams, so that amount would kill about 100 rats.

Of course mice are smaller than rats, and that fact makes it harder to work with them when these extremely toxic substances are involved. For the experiments on mice we finally had to use a 0.5 per cent mixture of "TEPP" in soybean oil to find that 1.0 milligram per kilogram would kill. Since the average mouse weighs only 1/50th of a kilogram, that dose means that only 1/50th of a milligram is needed to kill a mouse. So we have to go into small fractions to find the 0.0003 grains will kill a mouse in less than the hour and a half, and one drop would destroy 2500 of the pests.

These tests were carried out on the rodents by using an ordinary pair of hair clippers to remove most of the heavy fur from a small section of the back. The poison mixture was measured accurately in a hypodermic syringe and then spread over the exposed skin and rubbed in slightly with the side of the needle. With high doses the animals died within a very few minutes.

Earlier workers had reported that "HTP" was easily absorbed by the skin, and that it had high toxicity, so our results with "TEPP" were not entirely unexpected, even though degree of toxicity was almost unbelievable. To confirm danger, we decided to find out about skin absorption through different types of skin. It was felt that poison would have a pretty hard time soaking through the feet of chickens and pigeons, so we made a mixture of 25 per cent "TEPP" in soybean oil and merely dipped the feet of baby chicks in this preparation. The birds were then watched to be sure that they did not get the poison near the mouth or on the feathers. They were dead in less than 20 minutes. A final test was run by making a 20 per cent emulsion of "TEPP" in a vaseline-mineral oil base, and merely smearing this grease on a pigeon perch. As soon as the bird mounted the perch it was watched continuously to be certain that the poison was absorbed only through the feet. The pigeon was dead in one hour and twenty-four minutes.

All of these experiments—and similar, though less complete ones with hexaethyl tetraphosphate and 0,0-diethyl 0-p-nitrophenyl thiophosphate (another German insecticide)—have convinced us that these products must be handled with extreme care. All of the evidence now at hand leads us to recommend that any further experiments with these compounds be limited to controlled laboratory studies.

Hexaethyl tetraphosphate and 0,0-diethyl 0-p-nitrophenyl thiophosphate (common names "Parathion" or "Thiophos 3422") are being sold on the open market in the United States for specific insecticidal uses. Tetraethyl pyrophosphate is also available in commercial channels. As a consequence, it is recommended that persons handling these extremely toxic chemicals do so only after becoming informed as to the hazards involved. These organic phosphates are readily and rapidly absorbed through the intact skin. There is no irritation or other warning factor connected with skin absorption. The danger of possible chronic poisoning from repeated exposure to small amounts is unknown. The maximum quantity which can be tolerated without ill effect is also unknown.

Treat all of these new organic phosphate toxicants with the respect due such dangerous substances. Careless use may cause accidents serious enough to give credence to that wartime rumor that the Germans had developed a new and terrible "contact" poison. Care, on the other hand, may permit us to add several valuable new chemicals to our growing list of effective toxicants, without paying too great a price in learning how to use them.

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The Get Acquainted Meeting of Pest Control Operators

Kansas State College, Manhattan, January 31, 1948

Reported by Roger C. Smith

The Staff of the Department of Entomology at Kansas State College have deplored the lack of acquaintance with the Pest Control Operators of the state for many years. Until recently, it was thought the number of firms so engaged was possibly only eight or ten. However, with the appearance of the 1947 "Directory of Pest Control Operators in the United States" published by Pest Control and Sanitation, Home and Garden, it was discovered that 46 firms and individuals were engaged in this work and that the probable complete number might be 50. A meeting with these firms seemed therefore all the more desirable and necessary.

Accordingly, a "get acquainted" meeting of all the pest control operators and their assistants located or doing work in the state of Kansas was announced, to be held at Fairchild Hall, Kansas State College, Manhattan, Saturday, January 31, 1948, 10:30 a.m. to 3:30 p.m. This was a between semester period and the date suited the staff and institution but the icy highways kept many from coming.

The following was the program for the meeting:

Time

8:00 to 10:30—Registration and Exhibits.
The registration desk was in Fairchild Hall, Room 215. Registrants were asked to fill out the information blank, get their name card, and buy a luncheon ticket, the cost being 67 cents.

10:30 to 11:45—Program, Fairchild Hall, Room 202.
Roger C. Smith, Head Dept. of Entomology Presiding.

1. Introductions and Remarks on the Purposes of this Conference.
2. Pest Control Work in Kansas as Seen by the Extension Entomologist .... E. G. Kelley
3. The Pest Control Curriculum ..... D. A. Wilbur
4. Should the Pest Control Operators in This Area Form an Organization? .....General Discussion

11:45—Photograph of Group.

12:00 to 1:30—Luncheon, College Cafeteria, 2nd Floor, Thompson Hall. E. G. Kelley, Presiding.

5. Address: The Kansas Agricultural Chemical Law ..... Paul Ijams, Director, Control Division
6. Stored Products Insect Investigations. .....R. T. Cotton, Director, Manhattan Laboratory, Bureau of Entomology and Plant Quarantine.

1:30—Afternoon Session, Fairchild Hall, Room 202
D. A. Wilbur Presiding.

7. What's New In Insecticides, Paul A. Dahm
8. Rat Poisoning .... B. F. Lowery, Associate, Fish & Wildlife Service, U. S. Dept. of the Interior, Denver.
9. Round Table Question and Answer Period.

The following persons attended the get acquainted conference:

Roy Mason, Ragan Exterminator Rat Control Service, Kansas City, Mo.
Mr. and Mrs. W. K. Jarvis, Tox-Eol Termite Service
Mr. & Mrs. John Butler, Salina, Ks.
L. H. Thouvenall, O.K. Roofing and Termite Control, Peabody, Ks.
Johnnie Ratley, Peerless Termite and Pest Control, Emporia, Ks.
A. L. Linck, Paramount Fumigating Co., Kansas City, Mo.
O. T. Cook and Howard Stedman, Cook Chemical Co.,
Robert R. Schendel, Schendel Pest Control, Topeka, Ks.
J. O. Hibbard, Manhattan Pest Control Service
L. M. Redlinger, Manhattan, Ks.
J. B. Kring
E. Viale
Lester Gairloff and Ed Moorman, Underhill Terminix Company
Don Tremer, Tremer Exterminating Co., Abilene, Ks.
V. K. Giddings, Andrews Exterminating Co., Wichita, Ks.
B. C. Culver, American Cyanamid Co., Kansas City, Mo.
Don B. Whelan, Whelan Pest Control Service, Lincoln, Nebr.
Reynold Shuyler, Termite Exterminating Co., Kansas City, Kansas
R. R. Hinde, Salnia, Ks.
B. F. Lowery, Denver and J. E. Berger, Oklahoma City, Rat-Control specialists in the Fish and Wildlife Service.

First Row (Left to Right) Elva May Biehl, Leonard M. Redlinger, L. H. Thouvenell, Mrs. John A. Butler, W. K. Jarvis, Mrs. W. K. Jarvis, Adel S. Kamal, Maurice E. Lamb, B. F. Lowery.
Second Row (Left to Right) Glenda Bushey, G. O. Munger, Roy Mason, Robert R. Schendel Fred D. Butcher, B. C. Culver, Joe Moffett, E. Viale, R. T. Cotton.
Third Row (Left to Right) Don B. Whelan, E. T. Jones, J. M. Ratley Roger C. Smith, Verre K. Giddings, Harold E. Rife, James B. Kring, J. O. Hibbard.
Fourth Row (Left to Right) A. L. Linch, R. Shuyler, Ed. Moorman, Geo. Dean, E. H. Herrick, L. C. Kuitert, J. C. Frankenfeld, E. G. Kelley.
Fifth Row (Left to Right) R. H. Guntert, Don Tremer, J. W. Zanhnley, Leland Pangral, L. C. Peters, R. L. Parker, Mary Swart, H. R. Bryson, W. O. Wordy.
Sixth Row (Left to Right) W. C. Rhoades, E. G. Gross, Paul A. Dahm, D. A. Wilbur, Paul Ijams, John A. Butler, Dell E. Gates, R. H. Painter, Lester Gairloff, Orlan Cooley.

The following members of the staff of the Manhattan Laboratory of the Bureau of Entomology and Plant Quarantine were present:

R. T. Cotton — E. T. Jones
J. C. Frankenfeld — Fred D. Butcher

The following staff members and students of the Department of Entomology, Kansas State College attended the meeting:

R. C. Smith — **H. E. Rife**
R. L. Parker — A. S. Kamal
R. H. Painter — Ray Stansbury
P. A. Dahm — Carl Bauer
H. R. Bryson — Joe Moffett
L. C. Kuitert — Maurice Lamb
Geo. A. Dean — Orlan Cooley
D. A. Wilbur — J. O. Hibbard
W. C. Rhoades — L. M. Redlinger
W. W. Franklin — J. B. Kring
Dell Gates — E. Viale
W. O. Nord

E. G. Kelley, Extension Entomologist, Kansas State College.

G. O. Munger, J. W. Zahnley, Leland Pangrac, and L. C. Peters from the Department of Agronomy, attended the luncheon.

E. H. Herrick, of the Department of Zoology, Kansas State College, attended the afternoon session.

The question of a state organization of Pest Control Operators was discussed and all present spoke in favor of it. Accordingly, the following committee was unanimously elected to take the next step with reference to this matter: Reynold Shuyler, Chairman; R. R. Schendel and R. W. Hart. This committee has already issued a call for an organization meeting to be held at Manhattan, March 6. In addition to the business session, a round table discussion on termite control is proposed.

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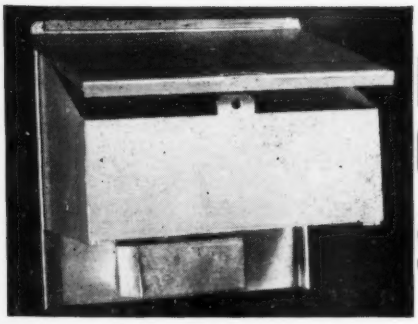

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Eighth Southern Pest Control Operators' Conference

Louisiana State University, January 29, 30, and 31, 1948

In spite of rain, sleet and cold the attendance at the Eighth Southern PCOs' Conference was surprisingly good with 114 present, not counting other interested persons. Seventeen states were represented.

The opening session on Thursday, January 29 was called to order by Dr. O. W. Rosewall at 9:45 A.M. Dean H. V. Howe of the College of Arts and Science welcomed the Pest Control Operators to the University and offered all facilities needed to make the conference a success. The response was given by W. A. Ruwaldt, President, Texas Pest Control Association. At this point in the program the audience stood for a minute of silent prayer in memory of the Hon. Harvey D. Wilson, late Commissioner of Agriculture of Louisiana and T. E. Franklin an outstanding Pest Control Operator of Houston, Texas.

Next the subject of " Bringing Us Up-to-date on New Chemicals and Formulations" was discussed by George L. Hockenyos President, NPCA and was followed by J. Harvey Sturgeon on the subject "Fumigations 1948—What's New". Then at 11:45 A.M. the session was adjourned for lunch. Very good meals were secured at the University Cafeteria at reasonable prices.

Immediately after lunch the afternoon session began with the last topic of the morning session "A New Phase of Pest Control" by Glen C. Prock. The afternoon session on "Termites" was presided over by W. B. Hill. In the absence of R. P. Turnley of San Antonio, Texas, Wm. O. Buettner led the discussion on "Inspections". Next J. L. Howell gave a comprehensive review of "Reports Including Recommendations Based on Inspections". Then followed the discussion of "Agreements and Termite Maintenance Service" led by Alfred Zimmern. Throughout the afternoon the PCO's showed keen interest in the Termite Control question and much discussion took place from the floor under the able guidance of Mr. Hill.

The night session took place at the State Capitol and was presided over by Wm. O. Buettner. The talk given by Dr. C. A. Trimbos on the subject of "My Idea of the Future of the Pest Control Industry" will be long remembered by the PCO's in attendance. Mr. Buettner then took over the meeting, discussing various problems of the PCO and before adjournment permitted L. S. Bridges, chairman of the "March of Dimes" for the Baton Rouge area, to pass his hat through the audience for a most generous contribution.

On the second day the morning session was called to order by H. O. Abel, presiding. The subject was "Rodent Control", and the program was arranged by Herman L. Fellton, who was the first speaker. He discussed the subject of "Some Up-to-date Facts on Rat Control" and was followed by G. H. Chapman on "The Use of HCN in Rodent Control" and "New Developments in Rat Stoppage" by A. B. Blieden. Next was the "Rat Control Demonstration" discussed jointly by C. M. Tarzwell and C. F. Fehn and a great deal of interest was shown in their exhibit of damage done by rats.

The afternoon session was on "Termites" and was again presided over by W. B. Hill. The phase of the subject taken up was the "Mechanics of Termite Treating" and the drawings in the Conference Manual were referred to by all speakers on the panel. Al Zimmern took the brunt of the attack because the drawings were made by him for the manual. This was a most interesting and instructive session on termites. The inclement weather did not permit the PCO's to make the planned outdoor inspections of termite infested buildings.

At 7:30 p.m. all PCO's and wives present, gathered at the Heidelberg Hotel for the banquet. L. S. Bridges was toastmaster and was ably supported by two past presidents, Wm. O. Buettner and J. Harvey Sturgeon. The speaker of the evening was George L. Hockenyos, president of the NPCA who spoke on the subject "The PCO and the Public".

The third day of the conference was only a half-day session at which Walter A. Helms presided. It began at 9:30 A.M. with a lecture on "Flies: What are They? Species?" by J. Harvey Roberts which was followed by a movie on the "Life Cycle of the Housefly". Next W. D. Beck was leader of a "Question and Answers" session on "Use of DDT in Control of Flies" and showed the DuPont movie on "Report of DDT". Then followed a general discussion of what subjects should be discussed at next year's conference.

After a demonstration of pressure spraying apparatus, outside the auditorium the conference was adjourned.

At 1:00 PM there was a meeting of the Louisiana Pest Control Operators' Association at which the new officers elected were J. Mandlebaum of New Orleans, La., president; J. H. McBride of Shreveport, La., vice-president and R. E. Couhig of New Orleans, La., secretary-treasurer.

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Paul Billiot, Orkin Exterminating Co. New Orleans, La.
C. R. Blair, C. R. Blair Laboratory, Alexandria, La.
A. Blieden, "Sanitation" Houston, Texas
C. G. Boone, American Cyanamid Co. Vicksburg, Miss.
Hugh G. Brannon, American Cyanamid Co. Cleveland, Miss.
Roger E. Breard,La. Dept. of Agriculture Baton Rouge, La.
L. S. Bridges, Pest Control Operator Baton Rouge, La.
Guy Brown, Guy Brown Pest Control Lubbach, Texas
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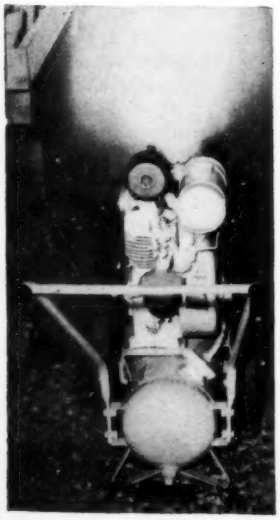

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Eastern PCO Conference

The 8th annual Eastern PCO Conference was held at the University of Massachusetts, Amherst, February 2, 3, and 4, with a registration of 147, and total attendance of 165. Fifteen states were represented. Attendance included sixteen public health and other governmental officials.

Flies were "pest of the year". Laboratory sessions dealt with the structure and identification of adult and maggot forms of the several common species. Vials of mounted specimens were provided as "take away" additions to the series being acquired annually for the permanent collections of registrants. These were prepared under the direction of curator Dr. Marion E. Smith. Laboratory exercises were conducted by the entomology staff, Dean C. P. Alexander, Prof. H. L. Sweetman, Dr. F. R. Shaw, W. B. Becker and John Hanson. The discussion panel on fly control was augmented by L. A. Carruth, Geneva, N. Y. and George L. Hockenyos.

The rodent control sessions, directed by Walter W. Dykstra, and the Fish & Wildlife Service staff, featured a new discussion group technique, with round tables devoted to various aspects of the subject. Bioassaying tests were conducted by L. R. Parkinson in connection with reported seasonal variation in the toxicity of ANTU. Methods and results of a local public dump project were reported by Frank Schuler and Max Robbins. "House Mice Control" was discussed critically by E. M. Mills.

The newer chemical compounds were reviewed and previewed by Dr. L. S. Henderson, USDA. In keeping with the NPCA theme that 1948 is the year for stock-taking, in anticipation of the postwar era, a detailed survey was conducted by John K. Medoff, in the interest of evaluating conference programs in general. A full evening was devoted to a forum for discussion of topics "for the good of the industry". This, and the other experiments in "member participation", was so well received as to forcast even more extensive use in future conference.

The annual banquet, with C. W. Houghton as toastmaster, was held at the Lord Jeffery Inn. The guest speaker, Dr. F. J. Sievers, was at his philosophical peak, and his message left a profound impression. There were brief addresses by Acting President R. A. VanMeter, Professor A. I. Bourne, and George L. Hockenyos.

The 8th Eastern PCO's Conference at University of Massachusetts, Amherst, Mass. February 2-4, 1948

— Calendar of Meetings —

Wisconsin PCO Assn. Short Course and Annual State meeting—April 1, 2, 3, 1948. University of Wisconsin, Madison, Wisconsin.

Purdue PCO Conference - April 5, 6, 7, 8, 9, 1948 - Purdue University - Lafayette, Indiana

National Restaurant Association Annual Convention and Exposition - April 14-17, Public Auditorium, Cleveland, Ohio.

NAIDM Mid-Year Meeting—June 14, 15, 16, 1948, Hotel Monmouth, Spring Lake, N. J.

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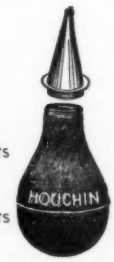

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Second Annual Pest Control Conference

The Pennsylvania State College, State College, Pa.

Wider horizons for Pest Control Operators, carrying higher standards, a more professional status, and emphasis on service, kept cropping up throughout the busy 3-day Pest Control Conference held February 5, 6, and 7, 1948 at the Pennsylvania State College. The 40-odd men at the second annual conference were all from Pennsylvania.

Greatest interest centered around the demonstrations and laboratory periods when the operators were given an intensive short course in identification, life history and control of various insects. However, in the discussion groups, considerable time was devoted to rat and mouse control, especially how Pest Control Operators can play a more leading role and be a part of the nation-wide campaign against rats.

Sparking the need for ever-widening horizons was Bill Buettner, secretary of the National Pest Control Association, who also made the principal address at the banquet, despite a cold that made speaking difficult for him. Buettner challenged the operators to "quit trying to get business from the other fellow and broaden your own field of operations." He declared that too many operators feel that all business is in the cities when farm orchard problems, agricultural graneries, warhouses and similar storage plants offer "unlimited possibilities".

"There's more to pest control now than there was 20 years ago", said Buettner, as he pointed to the need for more highly trained specialists who can cope with the vast number of new insecticides, rodenticides and other chemicals available for pest control work. He asserted that operators can do themselves and the industry a real service by joining with community campaigns in rat control. Despite the funds provided from public sources, pest control operators can secure untold prestige in their communities by serving as campaign leaders or consultants to organized drives, Buettner said. "Just because you're not getting paid for the job is no indication that this kind of service doesn't bring real profits", the national secretary asserted, as he urged the operators to "set their sights higher".

Only by such action can the industry achieve professional status and render full measure of service to the community in which it operates, Buettner contended.

Those attending the conference at Penn. State had the opportunity of hearing Ernest M. Mills, of the U. S. Fish and Wildlife Service tell the latest information on ANTU, 1080 and other rodenticides. Questions flew thick and fast as Mills reported latest national research findings and explained how rat control campaigns can be made more effective.

At the same time, J. O. Pepper, Edgar J. Udine and Henry Menusan, Jr., of the Pennsylvania agricultural extension service, reviewed the way several community and county-wide rat control campaigns were conducted in Pennsylvania. These extension entomologists served as consultants in drives made by rural organizations, and varying degrees of success were reported. All of the rural rat campaigns in Pennsylvania have been using fortified red squill. The poison was mixed in large quantities, often in concrete mixers, with lean horse meat or grain, then packaged and distributed by the farmers.

2nd Annual Pest Control Conference, The Pennsylvania State College, State College, Pa.

The extension specialists admitted they would prefer to drop the rat control demonstrations if such educational meetings could be handled by other trained persons. Prof. Pepper asserted that many "of you operators are missing a good bet" by not taking active participation in such drives.

More than $220 was added to the Research Fund established a year ago by the Pest Control Operators in honor of the late John Vogel, of Philadelphia. These presentations featured the banquet program at which Prof. Hubert Frings reported on work started with the original fund. Prof. Frings is in the midst of research studies exploring possibilities of using ultrasonics on insects and rodents, a wholly new field of endeavor.

It was at the banquet that Bill Buettner told the operators and their guests how pest control work is changing. "More training is needed for the serious workers", he said as he listed the trend towards more and more toxic poisons. He also urged the men to "police yourselves" toward higher standards and ethics. Only such action will prove to the public that operators are "not just quacks", he pointed out, as he illustrated how other professions, such as medicine have successfully accomplished public confidence by these tactics.

Buettner emphasized the need for more research, particularly in household insects and said the many new chemicals becoming available is part of a trend that "is just starting".

A. E. Ritt, of Philadelphia, served as toastmaster for the banquet. Dr. F. F. Lininger, director of the Pennsylvania Agricultural Experiment Station, made the address of welcome, and Martin Meyer, of Philadelphia, delivered the reply. Appropriate gifts were presented during the evening to those members of the faculty and staff at Penn State who aided in the combination conference and short course.

These included Dr. E. H. Dusham, head of the department of Zoology and Entomology at Penn State; Dr. S. W. Frost, Prof. N. D.Blackburn, Prof. L. E. Dills, and Prof. H. W. Frings, who handled the identification and insect habits instructions; Dr. D. E. H. Frear, research chemist who told of new insecticides; and the 3 extension entomologists, John Pepper, E. J. Udine and Henry Menusan, Jr.

The entire program was arranged by Prof. Frings, who made arrangements for the second annual conference, and who obtained the speakers and discussion leaders.

Those enrolled for the conference (also shown in photograph) include;

R. H. Bauer, Bauer Ext. Co., Ambler Pa.
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Geo. Cheinega, Vogel-Ritt, Allentown, Pa.
H. A. Clark, Hazelton, Pa.
J. J. Coudriet, Sanitary Ext. Co.
Williamsport, Pa.
M. Crossland, Vermin Control Co.
Uniontown, Pa.
A. H. Edwards, Vogel-Ritt, Allentown, Pa.
Harry Egner, Rose Ext. Co.,
Philadelphia, Pa.
Leo Ferris, Jos. R. Hynak
Scranton, Pa.
W. H. Grahn, Theodore Meyer Est.
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A. H. Helfgott, Remo Sanitation Ext. Co.
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ANNOUNCEMENT

Twelfth Annual PCO Conference, Purdue University, Lafayette, Indiana

April 5-9, 1948

Although in 1949 the dates of the Purdue Conference will return to prewar schedules, it is necessary in this year (1948) to advance the dates to the week of April 5th, which is "spring vacation", when we will have full facilities of the University.

It is urged that you fill out the attached registration questionnaire at your earliest convenience. It is important that we have a general idea of how many will attend. Likewise, make room reservations immediately. Please request reservations of the Union Club or the Lafayette hotels **direct** and ask for confirmation.

Here are the Hotel rates:

Union Club, Purdue Memorial Union:

Room with bath for one	$2.50
Room with bath for two	$4.00
Room with bath for two - twin beds	$5.00

Fowler Hotel:

Room with bath for one	$3.00, $3.25, $3.50, $3.75
Room with bath for two:	
Double bed	$5.00, $5.50, $6.00
Twin beds	$6.00, $6.50, $7.00
Room without bath for one	$2.50
for two	$4.00

Lahr Hotel:

Room with bath for one:	
Shower	$2.75, $3.00, $3.25
Tub	$3.25
Room with bath for two:	
Shower	$4.50, $5.00
Tub	$5.00
Twin beds	$5.00, $5.50, $6.00
Room without bath for one	$1.75, $2.00
Room without bath for two	$3.00, $3.50

Registration Fee: The registration fee to cover cost of Conference Manuel, banquet, and other items of expense, will be $10.00. The registration fee is the same whether you attend one day or all five days. Those who cannot attend but wish a copy of the Conference Manual can secure same, as long as the supply lasts, by sending check for $3.00, making it payable to J. J. Davis, or the Department of Entomology.

All Pest Control Operators, whether members of the National Pest Control Association or not, are cordially invited to attend. However, those who plan to attend should fill out the registration questionnaire and return to J. J. Davis, Purdue University, Lafayette, Indiana.

Exhibits: It is planned to have a room, or two, if necessary, for exhibits of insects, insect injuries, equipment, gadgets, and what have you. This should be available not later than Sunday, April 4th, earlier if possible. Send to J. J. Davis, Agricultural Hall, Purdue University, Lafayette, Indiana. Let's make this a corking exhibit.

Better Come! A good program is assured.

Sunday, April 4, 4:00 P.M.—6:00 P.M. Advance Registration, Purdue Memorial Union.

Monday, April 5, All day, Room 102, Agricultural Hall.

Monday, April 5, 9:00—12:00 A.M. Assembly Room, Agricultural Hall (Monday sessions deal with fundamentals which have been given each year and are intended for first and second year registrants only. Educational exhibits of equipment, insects, etc., will be provided in a room of Agricultural Hall for those arriving for Monday and who have attended more than two years. Members of the staff will be on hand to answer questions and explain the exhibits.)

Presiding—J. J. Davis
Introductory Remarks ..... J. J. Davis
Words of Welcome ..... Dean H. J. Reed
Insect Structures and Their Relation to Classification and Control ..... G. E. Lehker
The Biology of Insects ..... P. E. Montgomery
The Principles of Insect Control ..... J. J. Davis

Monday, April 5, 1:30—4:30 P.M. Room 201 Agricultural Hall.
Insect Classification ..... H. O. Deay, in charge.

Monday Evening, April 5. Open date for special group meetings. Groups desiring rooms should advise J. J. Davis in advance so that arrangements can be made. Specify hours and size of room desired.

Tuesday, April 6, 9:00—12:00 A. M.—Assembly Room, Agricultural Hall.

Flies ..... "The Bug of the Year"
Presiding ..... J. Harvey Sturgeon
The kinds of Flies and Recognition of Some of the Common Species ..... H. O. Deay
Biology of the Common Species ..... J. J. Davis
Economic Importance of Flies ..... E. E. Montgomery
Methods of Prevention and Control, with Special Reference to Barn and Cattle Spraying ..... W. N. Bruce
Adult Mosquito Control, with Special Reference to Camps, Resorts, Recreation Centers, etc. ..... John V. Osmun

Tuesday, April 6, 1:30—4:30 P.M.—Assembly Room, Agricultural Hall.

Sanitation and Consultation: A new Field for the PCO.
Presiding, George L. Hockenyos
Introductory Remarks ..... George L. Hockenyos
Dish Washing and Procedures in Taking Swab Counts ..... Jim Wilson
The Routine of Laboratory Technique in Determining Results of Swab Tests ..... Fred L. Willis
State Health Department Inspection Serivce, B. A. Poole
Consultation Service ..... Barlett W. Eldredge
Discussion Period.

Tuesday Evening, April 6, 7:30 P.M.—Memorial Union Building.
Presiding, Milton Caroline

Moving Pictures: 1. Antu, Modern Pied Piper
2. Four Little Mice
3. Report on DDT

Wednesday, April 7, 9:00—12:00 A.M.—Assembly Room, Agricultural Hall.

Termites
Presiding, B. C. Scherzinger

Bringing Us Up-To-Date on the Biology of the Subterranean Termite ..... T. E. Snyder
What Do We Mean by the Principles of Termite Control? ..... W. O. Buettner
Problems in Termite Control ..... Arthur Ochs
What Shall We Do About Guarantees? ..... H. L. Fellton and Lee C. Truman

Wednesday, April 7, 1:30—4:30 P.M.—Judging Pavilion

Application of Insecticides
Presiding, George C. Decker

The Hand Application of Sprays and Dusts....Al M. Akers
The Theory of Spray Nozzels and Their Application .....
Barn Spraying and Equipment ..... Virgil Knapp and Glenn E. Lehker
Fog Applicators and Their Use by the PCO ....W. S. Gilpin

Wednesday Evening, April 7, 7:30 P.M.—Memorial Union Building.

Wood-Infesting Insects
Presiding, C. O. Partlow

Recognition of Insects Attacking Wood and Their Damage ..... Ira Hatfield
The Control of Powder-Post Beetles ..... Glen E. Lehker
Bull Session on Insects Attacking Wood.

Thursday, April 8, 9:00—12:00 A.M.—Assembly Room, Agricultural Hall

Rats and Mice
Presiding, C. Norman Dold

The Life History and Biology of the Brown Rat ..... Milton Caroline
House Mice and Their Control ..... Ernest M. Mills
Rat Control in the Food Conservation Program ..... G. C. Oderkirk
Rodent Poisons and Bait Formulas ..... Ernest M. Mills
Round Table Discussion

Thursday Noon—12:15 P.M. Steps of Fowler Hall. Group Picture.

Thursday, April 8, 1:30—4:30 P.M. Assembly Room, Agricultural Hall.

Chemicals and Their Toxicity
Presiding, W. O. Buettner

DDT and Related Organic Chemicals .....
Chlordane ..... W. E. McCauley
Piperonyls ..... W. E. Dove
Benzene Hexachloride .....
Parathion ..... John V. Osmun
Other chemicals .....
A Summary ..... George E. Gould

Thursday Evening, April 8, 6:30 P.M. Memorial Union Building

ANNUAL DINNER

Toastmaster—F. C. Hockema, Vice-President, Purdue University.
Remarks—F. L. Hovde, President, Purdue University.
Remarks—V. C. Freeman, Associate Dean, School of Agriculture.
Remarks—William O. Buettner
A Football Review—Stu Holcomb, Head Football Coach, Purdue.

Friday, April 9, 9:00—12:00 A.M.—Assembly Room, Agricultural Hall.

Presiding, Al W. Price

Problems of the Food and Industries and How the PCO Can Help ..... Charley Clark
The Use of Rock Wool in Restaurant Exhausts to Remove Grease ..... R. O. Williams
Starling Control ..... Milton Caroline
How Can We Cooperate With and Secure Recognition from Health Departments ..... Harlem B. Ives

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Literature describes "Bes-Cub", a small portable aerosol-type power applicator which, it states, may be effectively used in homes, dairies, warehouses, theatres, restaurants, etc., for the control of moths, carpet bettles, flies, mosquitoes and similar pests. Handles full range of water emulsion and oil base insecticides; has remote applicator available to work 50 to 100 feet away from the machine where spot application is desired; 1½ to 3 hours tank capacity; one man operation; electric motor or gas engine. Equipment may also be used for flameproofing service.

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LOCAL ORGANIZATION NEWS

PEA Meets

There was an attendance of 26, comprising members and guests, at the monthly meeting of the Professional Exterminators' Association of N. Y., at the Hotel McAlpin, Monday evening, December 9, at which Joe Finneman presided.

Joe opened the meeting with a couple of good stories which set things up. The minutes of the previous meeting were accepted as written but not read. Following this came the inspiring announcement that the story behind the discovery of the mite causing rickettsialpox by Charles Pomerantz was to be dramatized in a broadcast over station WNBC (Du Pont Cavalcade of America) on February 16, with Paul Muni, noted actor, playing the role of Mr. Pomerantz.

The remainder of the meeting was given over to a variety of subjects. These included: suggested merger of the NYPCA and the PEA; pest control costs and their relation to price structure; New York City's Food and Sanitation Course for members of the Association, scheduled to start on December 16, Ernest Mills' Mouse Control Manual; hospitalization insurance; need for obtaining new members, and advertising. (Comment on this last-mentioned appears in an editorial, entitled "Practical Demonstration," elsewhere in this issue.)

The following committees were appointed:

Finance
- J. L. Huberman
- Samuel Cooper

Membership
- Al Friedman
- Samuel Diner
- Ray Davenport
- E. B. Natelson
- Alvin M. Weiss

Health Dept. and Legislation
- Joseph Finneman
- Milford H. Oachs
- J. L. Huberman

Etchics and Grievance
- David Cantor
- Bill Farrell

Program and Entertainment
- Charles Pomerantz
- Irving Drucker
- Joseph Finnemann

President Joseph Finneman is, of course, an ex-officio member of all committees.

In attendance were:
Charles Pomerantz, Bell Exterminating Co.
Samuel Diner, American Pest Control Co.
S. Lenoir-Michel, Secto Exterminating Co.
John Sibarium, Secto Exterminating Co.
Philip Haller, Virus Ltd., Inc.
Al Friedman, Friedman's Exterminating Service
F. A. Goehrs, A & G Exterminating Co.
N. W. Albert, A & G Exterminating Co.
E. B. Natelson, Lafayette Exterminating Co.
Alvin M. Weiss, Tri-Boro Exterminating Co.
Ray Davenport, Davenport Pest Control
J. L. Huberman, Scientific Exterminating Co.
William Farrell, Effective Exterminating Co.
Macy Simonetti, Banner Pest Control
David Cantor, Bell Extreminating Co.
John Gols, Metropolitan Vermin Ext. Co.
Milford H. Oachs, Ozane Co.
Samuel Cooper, DDT Exterminating Co.
Irving Snyder, Kraft Exterminating Co.
John B. Schmitt, Rutgers University
E. J. Palmer, John Powell & Co.
E. T. Thorpe, Tops Exterminating Service
Joseph Finneman, Pest Control Co.
Irving Drucker, Banex Exterminating Co.
Estelle Mendel, Arpco Products & Ext. Co.
Max Rosenthal, Pest Magazine

Nebraska State Association Being Planned

At a dinner-meeting at the Cornhusker Hotel, Lincoln, Nebraska, on Tuesday evening, January 20, plans were discussed for the formation of a state pest control association. A committee was elected to work out the necessary details. Members of the committee are: M. H. Usher, Lincoln, temporary chairman; Ward Coombs, Omaha, temporary secretary; as well as J. W. Hahne, of Omaha; and R. E. Kephart of Grand Island.

Another feature of the dinner-meeting were the discussions on better co-operation between PCO's and public agencies. C. H. Atkins, District Engineer of the Kansas City Division of the USPHS, gave a resume of the Service's program on control of communicable diseases, the relation of rodent control thereto, and the very important role that PCO's are having in that project. T. A. Filipi of the Sanitation Division of the State Department of Health outlined the sanitation and rodent-control program his deparment is advocating in municipalities—a program concerned with adequate garbage collection and disposal, and the distribution of information on rat control.

Dr. Ephriam Hixson, chairman of the University of Nebraska Entomology Department, discussed Pest Control Ethics, and the dangers involved in the use of the new chemicals, particularly the residues built up in the fatty tissues which become toxic. He foresaw more regulation later on by the National Food and Drug Administration on uses of certain chemicals in food plants. Basically, however, Dr. Hixson indicated he is an advocate of more education and less regulation.

All speakers from governmental or educational agencies, indicated they were receptive to enlisting the aid of PCO's, and that they did not believe in competing with private business except as a last resort.

Other members of the industry and guests present, and not previously noted, included: John Linn and Mrs. Linn; Walter Traudt and Mrs. Traudt; Charles Starkey and Mrs. Starkey; Mr. Mills and Floyd L. Fuller; all from Omaha; Mrs. M. H. Usher, Lincoln; R. M. Babcock, Sanitation Division of the State Department of Health; and Dr. Martin H. Muma and O. S. Bare, both of the Department of Entomology, University if Nebraska.

The meeting was a most constructive one, with much valuable ground covered, and did not adjourn 'till 11 p. m.

Arkansas P C Association

The first regular meeting of the Arkansas Pest Control Association was held February 14, 1948 in the Hotel Marion at Little Rock, Arkansas, at which time the following officers were elected:

President, Harvey Hewitt, Hewitt Pest Control Co. of Pine Bluff, Ark.

Vice President, R. G. Curry, Pine Bluff Termite Co.

Sec.-Treas., Carl L. Whitson, Orkin Exterminating Co. of Little Rock, Ark.

Board of Directors:
- Harvey Hewitt
- R. G. Curry
- Carl L. Whitson
- Delton Mills, Mills & Mills Exterminators of Texarkana, Arkansas
- Wordie Evans, Evans Laboratories of Little Rock, Ark.

The meeting date is set for April 17, 1948 to be held at the Hotel Marion, Little Rock, Ark.

—Submitted by Harvey Hewitt

Thirsty Insects Get Drinks From the Air

Some insects, at least, do not need to drink; their bodies are able to absorb water in vapor form from the air.

This has been neatly demonstrated by two Belgian scientists, J. Govaerts and J Leclercq, of the University of Liege, who report on their experiments in the British scientific journal Nature.

They kept several species of beetles and one bug species, without food, in closed vessels in which the air was saturated with water vapor. This was "tagged" by the addition of 8 per cent of "heavy water", in which the hydrogen atoms have double their ordinary atomic weight.

After a few days, some of the insects were killed and their body fluids analyzed. It was found that in all species the water from their bodies contained 8 per cent of heavy water—a clear demonstration that they had taken it directly from the air until they were in equilibrium with it.

Termites' Foes

True ants are enemies of the termite, the so-called white ant which is also a social insect living in colonies.

Correction

Par. 3, story New Federal Insecticide Act Reviewed at NAIDM Convention, January, 1948 issue, page 33, should read as follows: "A convention highlight was the answers presented by W. G. Reed, chief of the Insecticide Division of the Livestock Branch of the Production and Marketing Administration, USDA, to a series of questions on the new insecticide act—questions which, he pointed out, were most frequently asked regarding its interpretation."

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FOR ROACHES and RATS

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J-O Phosphorous Paste is so compounded as to eliminate the hazard of fire and possesses advantageous qualities peculiar to itself. A properly made **Phosphorous Paste** such as **J-O** is absolutely safe to use. It cannot burn or set fire to other substances.

Phosphorous, however, remains basic in the compound because it is the most toxic chemical used in pest exterminating, being more toxic than arsenic, strychnine or thalium. Approximately one-tenth of a grain will kill a rat. Phosphorous is a slow poison, taking from 6 to 18 hours to kill. Due to its slow but positive action, the rat succumbs to this poison. He becomes very uncomfortable and, seeking fresh air and water, in most cases, leaves the premises and dies in the open.

For all species of roaches, this product is **UNEXCELLED.**

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Use **PRENTOX**
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RED SQUILL (Powder & Liquid)
DDT PRODUCTS
For **PEST CONTROL**

PRENTISS PEST-TESTED INSECTICIDE CONCENTRATES

are offered to manufacturers and pest control operators—exclusively. They are not available for consumer use. You are invited to consult our technical staff on any material, formulation, or manufacturing problem on which we may be able to render assistance.

R. J. PRENTISS & CO., INC.

110 WILLIAM STREET NEW YORK 7, N. Y.

Penetration...

Insecticides *must* get into every crack and crevice—under mouldings, behind baseboards, between plumbing—and your sprayer *must* have complete penetration to reach these hiding places.

***Mistmaster* Portable Electric Sprayers give perfect and complete penetration. In this patented sprayer, insecticides are first broken into minute particles by a rotary compressor, then warmed above room temperature, and finally, atomized completely by tremendous pressure at the nozzle.**

The result is complete penetration. Insecticide floats longer in the air, settles gradually into every possible opening in complete strength, and does a thorough and effective job of coverage.

Other distinctive features of the *Mistmaster* Electric Sprayer are the Automatic Time Switch which can be set for spraying 1 to 24 minutes before shutting itself off, the volume control which regulates the density of spray to suit conditions, and the adjustable spray nozzle which may be directed in any position. Light in weight, built throughout to precision standards, this perfected sprayer is conveniently held in one hand, may be used for both portable and stationary spraying, and will give a life-time of thoroughly satisfactory service with all oil base insecticides.

Write for Free Literature* and complete information, or *mail the coupon

SPRAYER CORPORATION OF AMERICA
1700 Payne Street, Evanston, Illinois

☐ **Send complete information on MISTMASTER Ball Bearing Fan Type Electric Sprayers.**

☐ **We are interested in details of your dealer franchise.**

Name.....

Address.....

City.....**Zone**.....**State**.....

Sprayer CORPORATION of AMERICA

1700 PAYNE STREET, EVANSTON, ILL.

WHAT'S NEW IN PEST CONTROL-PERSONALS

Dr. Mortimer D. Leonard

Dr. Mortimer D. Leonard, nationally known authority on truck crop and garden pests, was stricken while attending the Massachusetts Fruit Growers Meeting at Worchester, Massachusetts.

Dr. Leonard, who is sales and technical representative of Julius Hyman & Company, Denver, Colorado, is now recovering at the Wesson Memorial Hospital, Springfield, Mass.

M. Vincent O'Shea, Jr.

M. Vincent O'Shea, Jr., administrative vice-president of Merck & Co., Inc., manufacturing chemists, died February 5 in the Harkness Pavilion of the Columbia-Presbyterian Medical Center, New York City. He was 49 years old.

Mr. O'Shea joined the company in 1947. Previously he had been executive vice president of the O'Sullivan Rubber Co., president of Robert Teller Sons & Dorner Co. and of Rosemarie de Paris, Inc., and a partner of Swart, Brent and Co.

During the war he served as an administrative officer in the Signal Corps and received the Legion of Merit from the U. S. Army.

A native of Madison, Wisconsin, Mr. O'Shea graduated from the University of Wisconsin in 1921 and started his business career as an industrial engineer with the American Telephone and Telegraph Co.

Mr. O'Shea was a member of the University and Union League Clubs of New York; the Cedar Creek Club of Locust Valley, Long Island; the Lake Placid Club; and Chi Psi Fraternity.

Herbert M. Decker

Mr. Gene J. Gerberg, President of Insect Control and Research, Inc., is pleased to announce that Mr. Herbert M. Decker, Sanitary Engineer, has joined the research staff. Mr. Decker, who received his Master's degree in Sanitary Engineering from the University of North Carolina, was formerly with the National Canners Association. During the war Mr. Decker served overseas as an officer in the U. S. Sanitary Corps.

Insect Control and Research, Inc., serve as entomologists and sanitation consultants in many food plants in Maryland and vicinity.

Paul D. Torpin

Paul D. Torpin, sales manager of McLaughlin Gormley King Co., Minneapolis, has been elected a vice-president and director.

John O'Neill

John O'Neill, of Hercules Powder Company (Canada) Ltd., Cellulose Products Department and Naval Stores Department, is now located in a new office in the Metropolitan Building, 44 Victoria Street, Toronto, Ontario.

Russell B. Stoddard

Russell B. Stoddard, who has been manager of the insecticide division of Dodge and Olcott, Inc., becomes, under its absorption by U. S. Industrial Chemicals, Inc., the coordinator of insecticide operations of USI. JOHN A. RODDA becomes an assistant USI sales manager for insecticides, and DR. WALTER E. DOVE becomes director of USI entomological research.

Seattle's Rats Stalemate Foes

Seattle—Seattle's rat exterminators are holding their own against an estimated 250,000 rodents in he city, but it is an endless battle.

Jack Lair, head of the rat slayers, said that although more than 100,000 are killed annually, they soon are replaced with newcomers. He estimated that one pair of rats produces about 250 descendants in one year.

He said 90 per cent of the rodents in the city were the big brown ones, weighing up to one and three-quarter pounds.

Miami PCO Receives Favorable Mention in "Life"

Lead paragraph of a story in December 29, Life, describing the wonders of Miami, says: "The big, red, door-to-curb carpet is out at Ciro's on Alton Road again. Truly Nolen, whose business is opening wealthy homes, . . . for the season and closing them after it, has crews hard at work, zipping off furniture covers and dusting elegant rooms." In addition to a splendid exterminating business in that area, Mr. Nolen, as just indicated, opens many of the palatial homes at the start of the season and also closes them at the end of the season, doing some cleaning and otherwise making certain that no vermin get a head start. Congratulations Truly, on your well-merited publicity!

NAIDM Mid-Year Meeting

The 1948 mid-year meeting of the National Association of Insecticide and Disinfectant Manufacturers, will be held June 14, 15, and 16, at the Hotel Monmouth Spring Lake, N. J. The 35th annual meeting will be held December 6 and 7, 1948, at the Hotel Commodore, New York City.

Radios For Blind

The American Foundation for the Blind is campaigning for funds to provide a radio for every blind person in America who cannot afford one. Clifton Fadiman, chairman of the radio fund and EMCEE on "Information Please", the radio program, points out in his appeal that, to a blind person, a radio is as necessary as food, clothing or lodging. It's the blind man's newspaper, the blind man's book, the blind man's contact with the outside world. The cost of each radio is $15.00, but the fund will welcome any part of that. The address: American Foundation for the Blind, 15 West Sixteenth Street, New York City. We can't think of a worthier cause.

Fluorobenzene Use In Insecticides Told

The preparation of fluorobenzene for use in "GIX", and insecticide analogous to DDT but using fluorobenzene in place of monochlorobenzene, and the compositon, method of manufacture, and testing of GIX and certain other German insecticides are described in three mimeographed reports now on sale by the Office of Technical Service, Department of Commerce, according to Oil, Paint and Drug Reporter.

GIX, an insecticide developed at the plant protection laboratory of I. G. Farbenindustrie at Hoechst, consists of 60 per cent "fluor DDT" (1,1 — bis (p-flourphenyl— 2,2,2 trichloroethane) and equal amounts of emulsifying agent and paraffin oil.

The reports are PB-77670 ("Flurobenzene Manufacture") 50 cents, thirteen pages; PB-360 ("Insecticides and Fungicides at the I. G. Farbenindustrie Plant, Hoechst"), twenty-five cents, fifteen pages; and PB-22413 ("Investigation of Insecticides and Insectifuge Research and Manufacture in Western Germany"), seventy-five cents, twenty-five pages.

Orders for the reports should be addressed to the Office of Technical Services, Department of Commerce, Washington 25, D. C., and should be accompanied by check or money order payable to the Treasurer of the United States.

German Insecticide Techniques Described

Information on the occurence, biology and control of insect pests which destroy grain in storage is described in a report now on sale by the Office of Technical Services, according to Oil, Paint and Drug Reporter. The forty-nine-page report, prepared for the British Intelligent Objectives Sub-committee, discusses the fumigants, sprays, chemical dusts, inert mineral dusts and other control measures used by the Germans against insects and mites causing infestation of stored grains.

Mimeographed copies of the report (PB-27714, "The Storage of Grain in Germany with Special Reference to the Control of Insect Pests") sell for $1.25. Orders should be addressed to the Office of Technical Services, Department of Commerce, Washington 25, D. C., and should be accompanied by check or money order payable to the Treasurer of the United States.

Clip These For Your Advertising Scrapbook*

How To Write Good Headlines

The most profitable advertisements usually lead off with a headline that holds out the product's specific promise to do something that people want done for them —or, negatively, to end some condition which people want to get rid of.

It isn't enough to cram appeal into the **body** copy. It's the headline that gets people into the copy; the copy doesn't get them into the headline.

To write a good Advertisement. .
Base it on these 5 fundamentals:

(1) GET ATTENTION. With a **layout** so striking or interesting that is stands apart from competition— or so uncommonly simple that its very restraint attracts. And with a **headline** holding out your product's promise to do something that people want done for them.

(2) SHOW PEOPLE AN ADVANTAGE. What can they save, gain, accomplish with your product? What can they lose or risk if they don't buy it?

(3) PROVE IT. With facts, specifications, consumer commendations, official recognition, guarantee.

(4) PERSUADE PEOPLE TO GRASP THIS ADVANTAGE. Sum up your copy appeal. Re-draw a quick word-picture of the advantage of your product in use, and how easy it is to get it.

(5) ASK FOR ACTION. If you want immediate action give people something specific to do—and put in an extra "hook", inducement, or reason for doing at once.

How effectively these five basic fundamentals are used determines the difference between the writer who fills white space with words and the writer whose words fill stores with customers.

*Suggested by Schwab & Beatty, Inc., N. Y. C. Advertising Agency.

Deer-Damage Control

Is the title of this booklet which discusses the deer problem, types of deer damage, problems of control and describes in some detail "Acme Toxo," a liquid deer repellent. Producer states this repellent is: (1) inexpensive; (2) practical; (3) weatherproof; (4) not harmful to deer or domestic stock; (5) not harmful to vegetation being protected; and (6) has proved its merit under field tests where deer-damage is serious.

Progressive Biological Company, Dept. P., 181 Columbia St., Cohoes, N. Y.

Starlings Don't Give A Hoot

The ubiquitous starling, feathered pest of cities, again has demonstrated that he is not to be taken in by traps of man's devising. When gunfire and fire hoses failed to oust the birds from Poughkeepsie's business district, some one sold the idea of scaring them away with dummy owls Two aluminum owls were placed this week atop a store in Market Street. The owls now are favorite perches of the starlings.

Termites Reek Vengence on Exterminator

C. B. Montgomery, local termite exterminator, suffered injuries recently while treating a house on Royal street, working atop scaffolding, a piece of which was constructed with some termite-eaten timber which gave way and Mr. Montgomery fell with the scaffold, causing two broken ribs and a strained shoulder ligament.

—Weekly County Press, Martin, Tenn.

Working Cats

In New Zealand, working cats who keep commercial warehouses free of rats and mice, get ration tickets for a 6-pennyworth of meat a week at the butcher's. Household cats are denied all ration privileges.

Rattlers Pay Way by Killing Rodents

If you see a rattlesnake in a place where children play, by all means kill him. But if you find one in a place remote from human haunts, better let him be. Rattlesnakes, like other snakes, pay their way in the world by keeping in check the swarming populations of hungry small animals, especially rodents.

By Science Service

New Pesticide Names Adopted

Two more common names have been accepted, according to BEPQ, and filed in the Trade-Mark Division of the Patent Office.

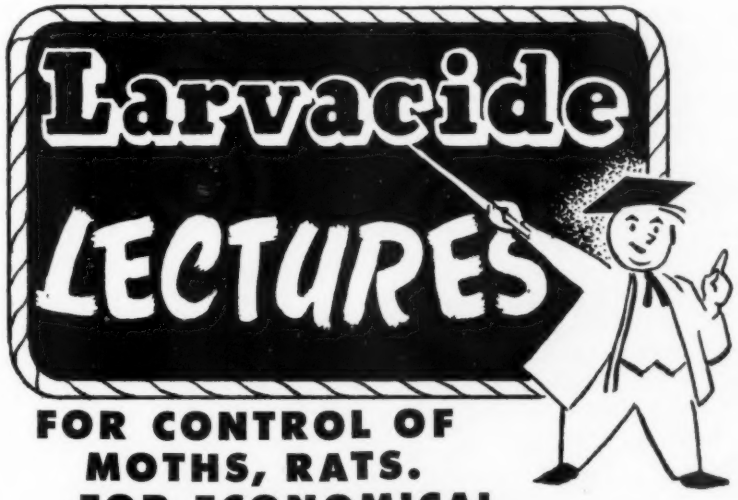
Hereafter, instead of speaking of 2,2-bis (p-methoxyphenyl) 1,1,1-trichloroethane or the methoxy analog of DDT, the tongue-tortured layman can simply say "methoxychlor."

And instead of referring to o,o-diethyl o-p-nitrophenyl thiophosphate, or 3422, he can now simply say "parathion."

Earlier steps in simplyfing the pesticide language include similar agreements on benzenehexachloride, chlordane, and chlordane camphene.

Rats Not Fat?

America's alley cats should not be shipped abroad to catch rats in Europe because they would not be well fed, Sydney H. Coleman, executive vice-president of the American society for the Prevention of Cruelty to Animals, New York City, said yesterday at his office, 50 Madison Avenue. Mr. Coleman said he had read newspaper stories of a plan to ship 1,000,000 American cats to Europe but that "the cats could not exist on the rodents they caught without definite supplementary feeding, which the people in the countries cannot give."



FOR CONTROL OF MOTHS, RATS. FOR ECONOMICAL INDUSTRIAL FUMIGATION

You Can't Beat LARVACIDE

the time-tested tear gas fumigant

It's the wise PCO who knows his LARVACIDE. Yes, LARVACIDE is the PCO's favorite for moth work, rat control and industrial fumigation. It's handiest for PCO's, too, because a few cans in the back of your car or truck equip you for small fumigation jobs any time or anywhere. Comes in handy 1 lb. dispenser bottles in sealed can 12 to case.

Also available in cylinders 25 to 180 lbs. Stocks in principal cities. Write today for FREE booklet PC9 describing LARVACIDE for Moth Work, Rat Control & Industrial Fumigation.

ISCO

Innis, Speiden & Co.

117 LIBERTY ST., NEW YORK 6

BOSTON CHICAGO CINCINNATI CLEVELAND OMAHA PHILADELPHIA

The SEAVER LABORATORIES

From a backyard to a downtown location is not an unusual expansion in the growth of commercial institutions, and the Seaver Laboratories at Beloit, Wisconsin, is no exception to this trend of development.

Years ago E. Seaver built a small laboratory at the rear of his residence. It consisted of a two-story frame structure housing his workshop on the first floor. His daughter, Vinola Seaver, occupied the second floor where she maintained a music studio, following her profession as a piano teacher.

It was in these quarters that Mr. Seaver did all of his experimental work and compounded rodenticides and insecticides. He devoted most of his spare time to the study of rodent life.

While Mr. Seaver was still alive, and without any training in the sales field, his daughter, Vinola Seaver, tried to get national recognition of her father's products but soon realized it would require considerably more money than the family possessed to adequately market the products.

After Mr. Seaver's death, about six years ago, his daughter Vinola gave up her musical career and took over management and production of the laboratory, compounding her father's formulas and supervising the servicemen in the field. In November of 1945 fire completely destroyed the building, equipment, and stock of the laboratory.

Thus fate and circumstances necessitated the establishment of a new location, and along with a former salesman, A. H. Lemmerhirt, a copartnership was established and a downtown location secured.

It was decided that a retail store for exterminating products could not be self-sustaining in a town the size of Beloit (30,000), and therefore sanitary products, janitor supplies, and agricultural insecticides were added. Therefore, the business branched out and they are now retailers and jobbers of the above supplies and are also continuing their previous operations as servicing contractors.

In planning the new headquarters consideration was given to the needs of rural as well as city folks and providing a place where all would feel free to come and discuss their pest problems and where they could take advantage of a reference library of books and magazines dealing with the subjects of entomology, rodents, and agriculture. Thus the educational and sales promotional features are developed and this is a valuable asset, especially in small cities with a rural clientele.

The sales room is attractively arranged with the color scheme in soft pastel shades. The walls are powder blue, the niches deep cream, and the adjustable shelves flesh color. The floor is of black and henna asphalt tile. Throughout the building fluorescent lighting is used.

In the rear of the main salesroom is a fairly large stock room, and adjacent to this is the mixing room.

In answer to the question, "Does it pay to be downtown?" Miss Seaver said, "By all means a decided Yes. Strangers come everyday to patronize us, and as we do our part in identifying their problems, in giving an honest opinion and providing technical advice regarding products best suited to meet their needs, we find a satisfaction in that these same customers not only return but advise their friends. It is up to us to gain their good will and confidence in what we have to offer."

View of the front of the Seaver Laboratories, Beloit, Wisconsin.

View of the Sales Room of the Seaver Laboratories, taken at the time of the opening of the new quarters.

Cost of Keeping Rats

Rats and mice, mankind's greatest animal enemies, cause enormous losses to agricultural crops, root crops, tubers, bulbs, cereals, and trees. Rats also transmit such diseases as typhus and bubonic plague. Maybe you don't know that it costs about two cents a day or $7.30 a year to keep a rat on your place. One rat will eat and destroy from 85 to 100 pounds of feed a year, or as much as is consumed by a laying hen. A recent survey showed that 225 rats will eat or destroy as much dry feed in a year as one mature cow and that 29 rats will eat as much as a sheep.

QUICK, EFFECTIVE BOXCAR FUMIGATION with

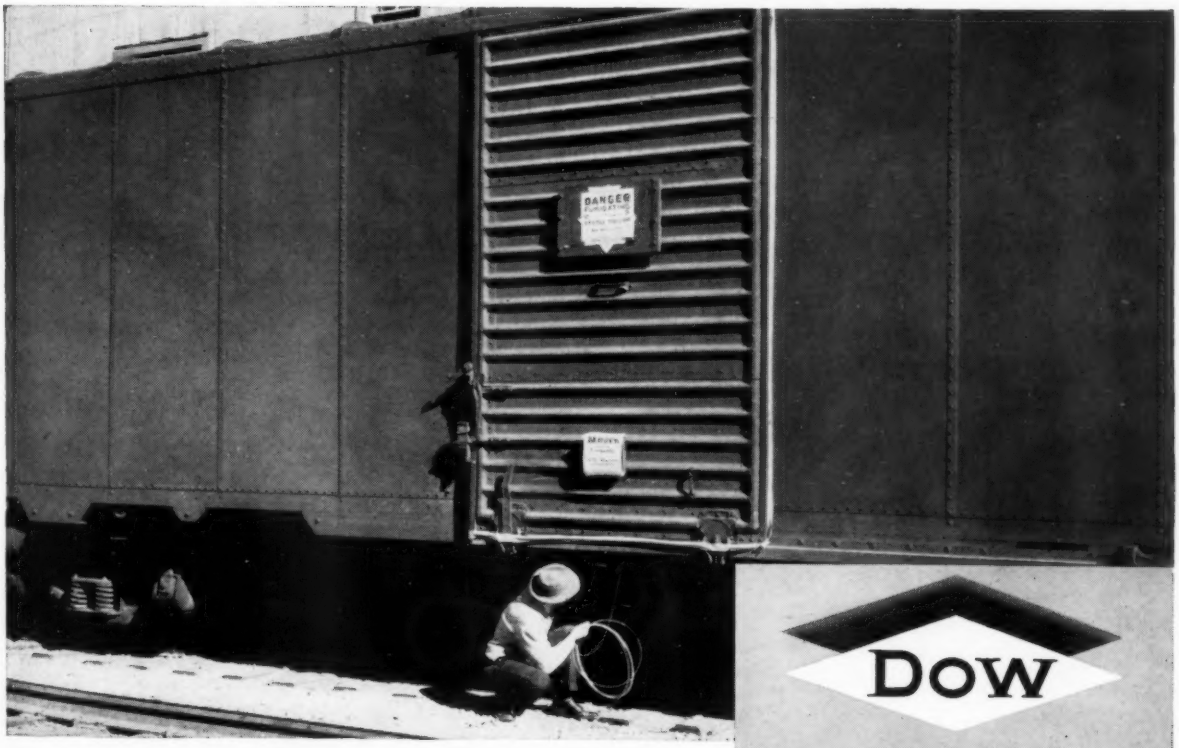
You—and your customers—can often save time, trouble and expense by fumigating foodstuffs right in the railroad car with Dow Methyl Bromide. Foremost among food fumigants, it quickly and thoroughly fumigates boxcars filled with cereals and bagged grains or flour, packaged food products and other foodstuffs.

You need no complicated fumigating equipment. Methyl Bromide is always applied from *outside* the railroad car by means of a copper or Dow Saran plastic tube attached to a Jiffy can puncturer or a Methyl Bromide cylinder. The tube is inserted through a hole drilled in the floor of the car or through some other convenient opening. The car must be thoroughly checked for leakage points and all such points sealed with masking tape, calking compound, or strips of greased paper. Then Methyl Bromide goes to work with its usual thoroughness, penetrating even to the centers of 140 lb. bags of flour stacked in large piles. Properly applied, it effects a 100% kill of rats and mice and all insect infestation, in all stages of development.

Don't overlook this opportunity for profitable new business! Write our Fumigant Division for literature giving full information as to quantities of Methyl Bromide required for fumigation of both steel and wood cars, length of exposure and aeration periods and other pertinent data.

→ Dow Methyl Bromide

The Penetrating Fumigant



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CHEMICALS INDISPENSABLE
TO INDUSTRY AND AGRICULTURE

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

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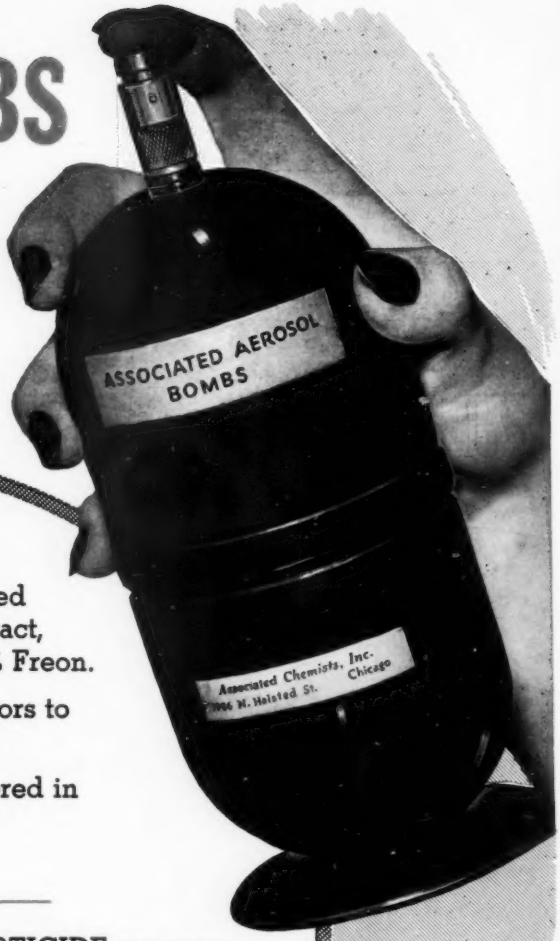
St. Louis • Houston • San Francisco • Los Angeles • Seattle
Dow Chemical of Canada, Limited, Toronto, Canada

AEROSOL BOMBS FOR RESALE



Filled with Standard Approved Insecticide—2% Pyrethrum Extract, 3% D.D.T., 10% Solvents and 85% Freon.

At prices which will enable Distributors to handle the bombs at attractive profits.

Supplied with Distributor's label if ordered in sufficient quantities.

Packed 24 to a Shipping Carton.

HI-TOX, MORTICIDE and SUPER-MORTICIDE are now obtainable with D.D.T. added. NO INCREASE IN OUR PRICES.

D.D.T. Solutions containing from 5% to 50% D.D.T. Technical Grade.

D.D.T. Powders with 10% to 50% D.D.T. Technical Grade.

MORTOLIN—Concentrate for Moth-proofing Compounds.

Write our office nearest you for full particulars.

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